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IISD REPORT

Global Goals and the Environment: Progress and prospects

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About this Report

This report has been prepared in support of the United Nations Environment Programme's (UNEP) activities to help UN Member States in their work on concluding the implementation of the Millennium Development Goals and ensuring a suitable integration of the environment into the post-2015 development agenda and the Sustainable Development Goals.

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The views put forward in this report are that of the authors, who also hold full responsibility for any errors or omissions.

Executive Summary

This report provides a comprehensive overview of progress on Millennium Development Goal (MDG) 7, Ensuring Environmental Sustainability based on official indicators and data. The report covers all developing countries to which MDG-7 applies as well as developed countries, where MDG-7 targets were considered as reference points related to other global environmental commitments. In taking a detailed stock of progress at the global, regional and national levels, its purpose is to offer an authoritative perspective on movement toward or away from MDG-7 targets agreed by the international community in 2000 indicator by indicator. Relying on statistical evidence, the report pinpoints what goals and targets have been met, by when and where, and in what areas has progress been inadequate.

As is commonly known, coverage of the environment in the MDGs was little more than symbolic and many key dimensions were not represented. Progress was globally uneven for most targets, and the indicators in this report confirm earlier observations that no target can be expected to be achieved everywhere. Furthermore, consistent reporting is constrained by persistent data limitations in many of the countries covered. In some cases, lack of reliable data represents a major constraint for reporting. Without a major effort to improve statistical data collection and observation systems, these problems will continue to persist and undermine the ability of countries to visualize their progress toward new goals.

The table below presents key highlights regarding global and regional progress with MDG-7 goals by targets and indicators.

Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources (qualitative targets only)	
7.1 Proportion of land area covered by forest (percent)	Forest area decreased from 32% to 31% globally between 1990 and 2010, with reduced forest quality. Significant decline in sub-Saharan Africa, Latin America and the Caribbean and Southeastern Asia and Oceania.
7.2 Carbon dioxide emissions (tonnes CO ₂ per capita/kg CO ₂ per US\$1 GDP in PPP)	Significant increase was observed in CO ₂ emissions from 21,550 to 31,387 million tonnes/year at the global level. There was a 26% drop in the share of developed countries in global emissions, accompanied by a rapid increase in developing regions, where per capita emissions grew from 1.66 to 3.16 tonnes/person/year between 1990 and 2010.
7.3 Consumption of ozone-depleting substances (ozone depletion potential [ODP] tonnes)	Almost 98% of substances contributing to the destruction of the ozone layer have been phased out of production and use. Developed countries almost completely eliminated ozone-depleting substances, while developing countries achieved 86% reduction as compared with a 1990 baseline.
7.4 Proportion of fish stocks within safe biological limits (percent)	Out of 600 monitored marine fish stocks in 2009 29% were considered exploited beyond safe biological limits. Only about 10% of commercially valuable marine fisheries are monitored, mostly on an irregular basis.
7.5 Proportion of total water resources used (percent)	9.2% of total water resources were used in 2006, with no time series data available. High water use was noted, particularly in Northern Africa, Caucasus and Central Asia, Western and Southern Asia, with about 30% of the global population experiencing water stress.
Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss	
7.6 Proportion of terrestrial and marine areas protected (percent)	Terrestrial and marine protected areas increased from 8.3 to 14% between 1990 and 2012, with the highest increase in Latin America and the Caribbean (by 8.7% to 20.3%) and the lowest in the Caucasus and Central Asia region (by 0.8% to 3.6%). However, 6 out of the 14 global biomes have less than 10% protected, as identified by the applicable Aichi Target.
7.7 Proportion of species threatened with extinction (percent)	The number of species that are expected to become extinct in the near future increased from 7.9% to 8.7% between 1990 and 2012 at the global level. Northern Africa, West Asia and Latin America and the Caribbean recorded the largest increase.

Target 7.C: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation	
7.8 Proportion of population using an improved drinking water source (percent)	The target of cutting in half, by 2015, the proportion of people without sustainable access to safe drinking water was met by 2010, moving from 76% to 89%. The largest increases were in China, India and the broader Eastern and Southern Asia region, while a decline is observable in the Caucasus and Central Asia. An urban / rural divide persists, with only 4% of people without adequate access to water in cities, in contrast with 19% in rural areas.
7.9 Proportion of population using an improved sanitation facility (percent)	In contrast with the target (sustainable access to sanitation for 75% of the population in the developing world) in 2010 the numbers stood at only 56%, making it very unlikely that the goal will be met by 2015. While significant improvement in access was recorded in Eastern and Southeastern Asia, in sub-Saharan Africa access improved only 4% between 1990 and 2010, reaching only 30% coverage.
Target 7.D: Achieve, by 2020, a significant improvement in the lives of at least 100 million slum dwellers	
7.10 Proportion of urban population living in slums (percent)	The proportion of population living in slums decreased in all regions of the world between 1990 and 2012 except West Asia. While South Asia and North Africa achieved 21% and 22% improvement, respectively; in Africa only 8.3% improvement was observed and 70% of the people still live in slums. Meanwhile the total number of people living in slums increased from 650 million in 1990 and 760 million in 2000 to 863 million in 2012.

Besides reviewing global and regional progress, assessing country-level environmental performance is also important. Comparing countries' performance to baselines might help explain progress (or lack thereof) and hence hint at opportunities for acceleration in the post-2015 period.

While individual indicators helped measure progress toward specific MDG targets, understanding why change happened in either a positive or negative direction requires looking at interlinkages between goals and indicators cutting across several themes. While detailed country-level analysis was beyond the scope of this research, connections between several MDG-7 areas could be identified. In order to establish that there is more to the connection than just co-occurrence of two unrelated factors, additional literature on the functional relationship between the respective MDG-7 factors was consulted.

The research found connections of varying strength between eight pairs of MDG variables. These connections clearly show that healthy ecosystems are a prerequisite to meeting some of the most essential goals of global development. Protecting the integrity of forests, the health of fish stocks or keeping the ozone layer intact are of fundamental, not tangential, importance for human well-being. This is particularly the case for the poorest and most vulnerable, who are the most likely to directly depend on the provisions of these aspects of the environment for their well-being and often survival. Efforts to reduce extreme poverty are inseparable from efforts to keep ecosystems and environmental conditions healthy and robust.

The area where the report found perhaps the strongest evidence of this relationship was between the global goals related to the need to reduce maternal mortality versus the need for improving sanitation facilities. Data from sub-Saharan Africa shows that countries successful in improving access to clean water and sanitation tend to also show significant improvement in maternal health, a finding also supported by more detailed literature on the interconnections of these factors.

Results based on the analysis of MDG-7 performance lend support to the view that strong environmental goals are a must for meeting some of the key human development objectives.

Table of Contents

1.0 Global and National Progress Toward MDG-7	3
Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.....	4
7.1 Proportion of Land Area Covered by Forest.....	4
7.2 Carbon Dioxide Emissions.....	8
7.3 Consumption of Ozone-Depleting Substances.....	12
7.4 Proportion of Fish Stocks Within Safe Biological Limits.....	14
7.5 Proportion of Total Water Resources Used	15
Target 7.B: Reduce Biodiversity Loss, Achieving, by 2010, a Significant Reduction in the Rate of Loss.....	18
7.6 Proportion of Terrestrial and Marine Areas Protected.....	18
7.7 Proportion of Species Threatened With Extinction.....	19
Target 7.C: Halve, by 2015, the Proportion of the Population Without Sustainable Access to Safe Drinking Water and Basic Sanitation	21
7.8 Proportion of Population Using an Improved Drinking Water Source.....	22
7.9 Proportion of Population Using an Improved Sanitation Facility	24
Target 7.D: Achieve, by 2020, a Significant Improvement in the Lives of at Least 100 Million Slum Dwellers.....	27
7.10 Proportion of Urban Population Living in Slums.....	27
2.0 Exploring the Drivers of MDG-7 Trends: Economic growth, demographic changes and carbon dioxide emissions.....	29
3.0 How Development Can Help the Environment: Co-benefits and interlinkages.....	32
4.0 Conclusions	38
References.....	40
Annex 1: Table of interlinkages	48

List of Tables

Table 1. MDG-7 targets and indicators.....	3
Table 2. ODS emissions, tonnes/year	13
Table 3. Proportion of total water resources used in percent in 2006 or in year closest to 2006.....	16

List of Figures

Figure 1. Proportion of land area covered by forest (per cent)	5
Figure 2. Highest afforestation rate between 1990 and 2010 (per cent) in countries with total population higher than 5 million	5
Figure 3. Highest deforestation rate (per cent) between 1990 and 2010 in countries with a population higher than 5 million	6
Figure 4. Total Carbon Dioxide emissions (Millions of tonnes) based on the UN MDG Indicators database calculations from the United States Carbon Dioxide Information Analysis Center (CDIAC)	8
Figure 5. Highest increase in CO ₂ emissions per capita in countries with a population higher than 1 million (tonnes of CO ₂) based on the UN MDG Indicators database calculations from CDIAC	9
Figure 6. Highest carbon dioxide emissions per capita reduction in countries with a population higher than 1 million (tonnes of carbon dioxide) based on the UN MDG Indicators database calculations from CDIAC	9
Figure 7. Highest decrease in carbon dioxide emissions intensity in countries with a population higher than 1 million (kg carbon dioxide per \$1 GDP in PPP) based on the UN MDG Indicators database calculations from CDIAC	10
Figure 8. Percent change of total GDP, GDP per capita, total CO ₂ , CO ₂ per capita, CO ₂ emissions and population of Singapore between 1990-2010	11
Figure 9. Proportion of fish stocks within safe biological limits (Percent)	15
Figure 10. MDG Water Indicator around 2006.....	17
Figure 11. Percentage of total protected terrestrial areas	18
Figure 12. Countries with increase in total protected terrestrial areas over 25 per cent	19
Figure 13. Percentage of species expected to become extinct in the near future by region.....	20
Figure 14. Comparison of percentage of total protected terrestrial area and species expected not to become extinct in the near future.	21
Figure 15. Percentage of population with access to improved drinking water sources.....	22
Figure 16. Countries with highest improvement in percent of population with access to improved drinking water sources (with population above 1 million)	23
Figure 17. Percent of population with access to improved sanitation facilities	25
Figure 18. Countries with fastest improvement in sanitation access (&).....	25
Figure 19. Comparison population using improved drinking water sources and sanitation facilities (%)	27
Figure 20. Proportion of population living in slums, by region (%).....	27
Figure 21. Percentage change of total GDP, GDP per capita, total CO ₂ , CO ₂ per capita, CO ₂ emissions and population of Norway between 1990-2010	29
Figure 22. Percentage change of total GDP, GDP per capita, total CO ₂ , CO ₂ per capita, CO ₂ emissions and population of Republic of Korea between 1990-2010	30
Figure 23. Highest reductions in percentage maternal mortality rate vs. percentage improved sanitation facilities (sub-Saharan African countries with a population higher than 1 million).....	37

Introduction

On April 5, 2013, the United Nations recognized there remained 1,000 days until the end of 2015—and the expiration of the Millennium Development Goals (MDGs). In an event drawing attention to the limited timeline, Ban Ki-moon, UN Secretary-General, remarked that the MDGs constituted “history’s largest and most successful anti-poverty push,” while encouraging the world to accelerate action and increase commitment to achieving its eight global goals.

As MDG implementation is now in its final phase, it is important to qualitatively and quantitatively understand and analyze the progress that has been made toward these goals in the past 13 years and consider what we can learn for the future. The targets of MDG-7 on environmental sustainability represent a particularly important area for analysis: biodiversity, water, urbanization and the broader issue of environmental sustainability are prerequisites for socioeconomic development. They are critical for eradicating poverty, the provision of basic services and all other central development concerns. When assessing the global, regional, and national achievements of MDG-7, we need to understand the progress made and related lessons learned, while also taking into account other relevant changes in the world. Recognizing the inherent difficulty of the question, we have to understand whether progress toward goals can be attributed to measures directly aimed at them or some major external factor, such as the global financial crisis, the rise of new technologies, or new approaches to governance.

Progress toward the MDGs at the global level was comprehensively evaluated at the 2013 UN Millennium Development Goal Review Summit. In his report for the Summit, the UN Secretary-General called for accelerating progress on MDGs, and, in cases where the goals are not projected to be met, finish the required work by integrating MDG aspirations into the post-2015 development agenda (United Nations General Assembly, 2013).

Running parallel to this final push for MDG achievement are the efforts to define the global goals of the future—the post-2015 development agenda through the UN General Assembly (GA), Economic and Social Council (ECOSOC), and its specialized agencies, programs and funds. The mandate accepted in the Rio+20 conference to agree upon sustainable development goals (SDGs) at the global level presents an important entry point for the themes of MDG-7 to be carried on into the post-2015 era, complemented by other key environmental priorities that are also essential for sustainable development but were not represented in MDG-7.

Given the interlinkages between the environment and human well-being in a globalizing world, a systematic integration of the environment into the global development agenda is necessary (Haas, 2009; Kanie, 2012; United Nations Environment Programme [UNEP], 2013). To ensure development efforts are supported (and not undermined) by environmental conditions over the course of the next 15 years and well beyond—unlike in the MDGs— all key aspects of the environment must be clearly represented in the broader post-2015 agenda. With a better understanding of the successes and failures of MDG-7, and their causes, the international community stands a better chance of achieving an effective transition from the development agendas of the past to those of the future.

The goal of this report is to take stock of progress toward all MDG-7 targets in all countries the MDGs applied to, and identify, where possible, lessons that will help with the formulation and implementation of goals to ensure environmental sustainability in the future. The timing and policy context for laying out the case is important. Due to the overlap between the closing period of the MDGs and the negotiation of and transition to the SDGs

for the post-2015 development agenda, major strategic issues are on the table. Such opportunities do not come often: once the new development agenda is agreed in September 2015 it will influence the nature and direction of official development cooperation, the activities of the philanthropic sector and private sector investments for many years, potentially decades. At the higher level, it should define universality, address equity and governance. Crucially, it will also influence whether addressing environmental sustainability challenges will continue to be an end-of-pipe matter and delegated to the narrowly construed environment sector, or seen as a systemic issue with a more nuanced understanding of driving forces and pathways to possible solutions. The risks are real, as some argue the reductionist nature of goals and quantitative targets associated with the MDGs were a factor in the oversimplifications that prevented a more effective approach to development policy in the 1990s (e.g., Fukuda-Parr, 2012).

Chapter 1 of the report reviews progress toward MDG-7 targets at the global and regional level based on official indicators. It discusses the gap between MDG-7 targets and actual progress, reviews the nature and direction of trends (and their explanations), and whether they are related to actions put in place to achieve MDG-7 targets or also rooted in external factors. It also looks at current initiatives and opportunities for accelerating progress in the transition period between the MDGs and the SDGs. Chapter 1 also looks at progress at the national level and identifies countries that made the most significant progress compared to their national baseline at the beginning of the MDG implementation period. It takes a more detailed look at those selected countries where performance was strong, to see if interlinkages exist between relevant environmental and non-environment trends—they might help explain progress (and hence hint at opportunities for acceleration) in the transition period and integrated treatment of the issues in the SDGs. Chapter 2 touches on the global driving forces of environmental change that are (and will be in future) important determinants of MDG-7 and subsequently SDG performance. Building on these chapters, Chapter 3 discusses the implications of current MDG-7 trends and their direct and indirect interlinkages with drivers, including trade-offs and co-benefits involved when several MDGs are simultaneously achieved. It will then review implications for addressing environmental priorities in the SDGs through development-related, integrated goals and implementation mechanisms. Chapter 4 offers a set of overall conclusions.

In order to review MDG-7 progress, the project team relied primarily on data in the UN's MDG-7 indicator database; unless otherwise indicated, data for the indicator charts in this document is from this source.¹ As expected, data availability was uneven both from the spatial and temporal coverage points of view, and in several cases represented a significant constraint for the analysis. While addressing data gaps in global databases was beyond the mandate of the project, in a few selected cases, as indicated, other data holders were contacted and additional data acquired. In some cases the conclusion has to be made that acceptable data for MDG-7 reporting is simply not available, indicating underlying weaknesses in statistical data collection and monitoring systems.

The illustrative analysis of the interlinkages between environmental and development performance for specific issues and indicators was based on a conceptual model of driving force–pressure– environmental condition connections, but given the complex, multi-criteria relationship between most types of environmental change and the causal forces of change, no statistical analysis was carried out. The analysis of MDG-7 trends and interactions at the global and sub-global levels was supported by a review of the most relevant literature.

¹United Nations Statistics Division. (n.d.)

1.0 Global and National Progress Toward MDG-7

The MDGs comprise eight goals, supported by underlying targets and indicators, with an implementation period ending in 2015. The goals aim for the eradication of extreme hunger and poverty, universal primary education, gender equality and the empowerment of women, the reduction of child mortality, improvements to maternal health, a reduction in HIV/AIDS, malaria and other diseases, environmental sustainability, and the establishment of a global partnership for development (UN, 2001). To ensure environmental sustainability, four underlying targets and 10 overall indicators were established for MDG7 (Table 1).

TABLE 1. MDG-7 TARGETS AND INDICATORS

TARGETS	INDICATORS
Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources	7.1 Proportion of land area covered by forest (percent) 7.2 Carbon dioxide emissions (tonnes CO ₂ per capita/kg CO ₂ per US\$1 GDP in PPP) 7.3 Consumption of ozone-depleting substances (ozone depletion potential [ODP] tonnes) 7.4 Proportion of fish stocks within safe biological limits (percent) 7.5 Proportion of total water resources used (percent)
Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss	7.6 Proportion of terrestrial and marine areas protected (percent) 7.7 Proportion of species threatened with extinction (percent)
Target 7.C: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation	7.8 Proportion of population using an improved drinking water source (percent) 7.9 Proportion of population using an improved sanitation facility (percent)
Target 7.D: Achieve, by 2020, a significant improvement in the lives of at least 100 million slum dwellers	7.10 Proportion of urban population living in slums (percent)

Source: UNEP (2003).

Given that the MDGs were derived from a Secretary-General-driven, rather than a participatory, country-driven process grounded in a conceptual framework of environment and development, the MDG-7 targets are rather fragmentary and do not reflect all important aspects of environmental sustainability. Important aspects missing from MDG-7 include, for instance, several of those which are known today as planetary boundaries, such as ocean acidification (Rockström et al., 2009; Steffen et al., 2015). Also missing are perspectives such as ecosystem-based management or resilience that reflect the need to address environmental issues as an outcome of dynamic environment-society interactions. While planetary boundaries and some of the substantive global environmental issues such as ocean acidification are still not covered by the SDGs, leaving open the question of how they will be addressed, resilience is included in Goal 14 and 15.

With these caveats in mind, while considerable progress has been reported toward the achievement of several MDG-7 targets since 2001, none of them are expected to be achieved in all regions of the world by 2015 (UN,

2012a). Progress toward the different environmental sustainability targets shows a mixed picture for both the different indicators, and for regional and national distribution (United Nations Development Group [UNDG], 2010). In the following sections, an overview of progress is provided for each target and underlying indicators. Due to the earlier discussed data problems, the ability to report on progress is uneven.

Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources

This target incorporates five indicators, including: the proportion of land area covered by forest, carbon dioxide emissions, consumption of ozone-depleting substances, proportion of fish stocks within safe biological limits, and proportion of total water resources used. As this target is qualitative, no quantitative, time-bound targets have been established for these indicators, and as results, conclusions cannot be drawn on the degree of “achievement,” only a general discussion of trends based on each indicator. Overall, while considerable progress has been made in decreasing the consumption of ozone-depleting substances (UN, 2013), global emissions of carbon dioxide have increased by more than 46 per cent since 1990. At the global level, the proportion of land area covered by forest has been decreasing by a small margin each year, accompanied by a growing ratio of plantation, as opposed to natural, forest. As of 2010, nearly one third of marine fish stocks have been overexploited and 20 per cent of the world’s population faces physical water scarcity.

7.1 Proportion of Land Area Covered by Forest

At the global level, the proportion of forested land area decreased, but at a minimal rate, from 32 per cent to 31 per cent (4,168 million to 4,033 million hectares), between 1990 and 2010. Regional data shows that the rate of deforestation was much faster in sub-Saharan Africa, Latin America and the Caribbean, Southeastern Asia and Oceania. Considerable positive change (4 per cent increase) was only observed in Eastern Asia. Not only has the global forest area been decreasing each year, but the remaining forest is of lower quality with reduced biodiversity, due in part to the establishment of large-scale forest plantations for industrial wood production (Earth Policy Institute, 2012).

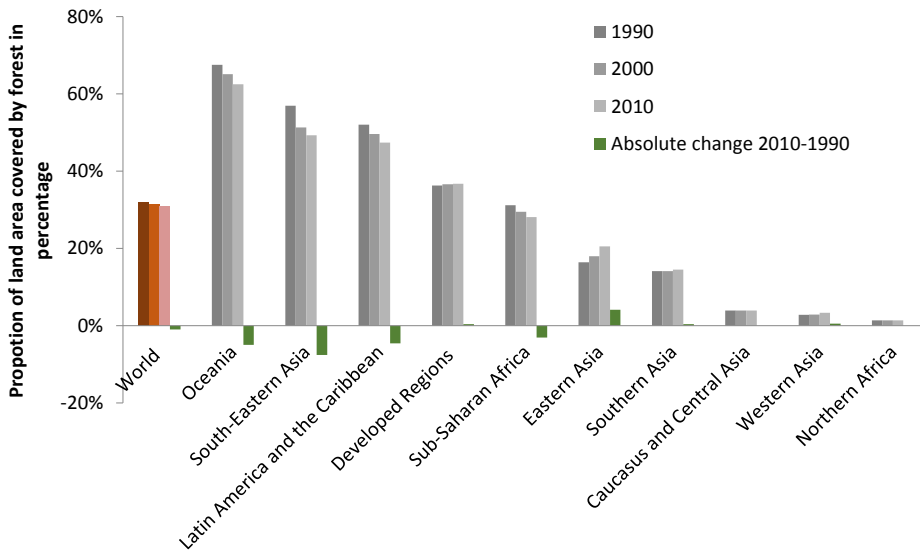


FIGURE 1. PROPORTION OF LAND AREA COVERED BY FOREST (PER CENT)

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

While the proportion of land area covered by forest has not decreased significantly at the global level, and the highest regional changes were around plus or minus 4 per cent, in some cases significant afforestation or deforestation was recorded at the country level. While many of the countries where this is the case are relatively small in terms of land area and population, larger countries such as Viet Nam or Spain have also achieved a significant increase (14.3 per cent and 8.7 per cent, respectively) in forested land. The chart below shows those top-performing countries with total population higher than five million.

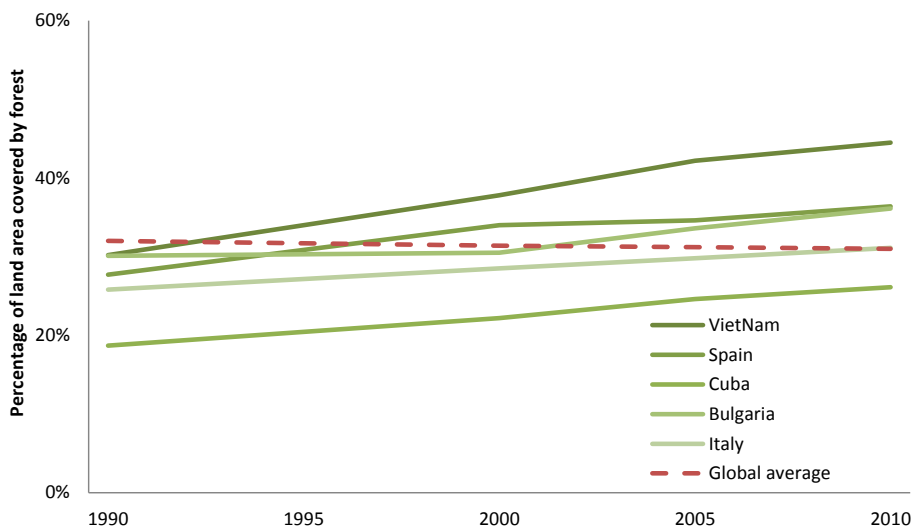


FIGURE 2. HIGHEST AFFORESTATION RATE BETWEEN 1990 AND 2010 (PER CENT) IN COUNTRIES WITH TOTAL POPULATION HIGHER THAN 5 MILLION

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

CASE STUDY: EXPLAINING AFFORESTATION TRENDS IN VIET NAM

Viet Nam achieved a 14.3 per cent increase in land area covered by forest between 1990 and 2010, making it the fourth-highest global performer on the forest area indicator of MDG Target 7.A. The country accomplished this through a series of national policies, partnerships, and legal mechanisms, which enforce forestry certification standards, encourage dialogue with stakeholders, and an improvement in land tenure rights for local communities.

In 1997, the Government of Viet Nam enacted policies to significantly limit forest harvesting, and established the National Working Group on Sustainable Forest Management and Forest Certification in 1998 (World Wildlife Fund [WWF], 2013). These efforts have decreased forest areas available for harvesting, while introducing Forest Stewardship Council (FSC) certification. Standards help promote sustainable management practices, including protection and regeneration of forest resources.

The Forest Sector Support Partnership (FSSP) was established in 2001 to provide a platform for the Viet Nam government, private sector investors, civil society organizations, donors, and local actors to share their views on forest sector initiatives, and to provide technical reviews (World Bank, 2007). The FSSP coordinates programs in areas of forest management and development, protection and conservation, processing and trade, education and training, and institutions and policy. In 2007, the FSSP held a Forestry Partnership Forum event, which brought together more than 160 diverse participants.

Finally, a strengthened focus on land tenure rights for local communities whose livelihoods are dependent on forest resources has resulted in a decrease in illegal logging in the villages involved (Ecosystem Marketplace, 2013). Efforts that support small-scale forest management at the local level have had positive effects country-wide. Local farmers with new property rights can now leave forested land that is unsuitable for agricultural production, while increasing the agricultural production on more fertile lands. This has increased the country's rice production while forest cover increased. Likewise, with the decline in illegal deforestation, there has also been decreased conflict and crime at the local level.

At the same time, in countries like Zimbabwe, Cambodia or Ecuador, the deforestation rate ranged between 16.9 per cent and 15.1 per cent, and in eight other countries it was higher than 10 per cent in the 1990 to 2010 period. Figure 3 shows countries experiencing the highest forest area losses with a population higher than five million.

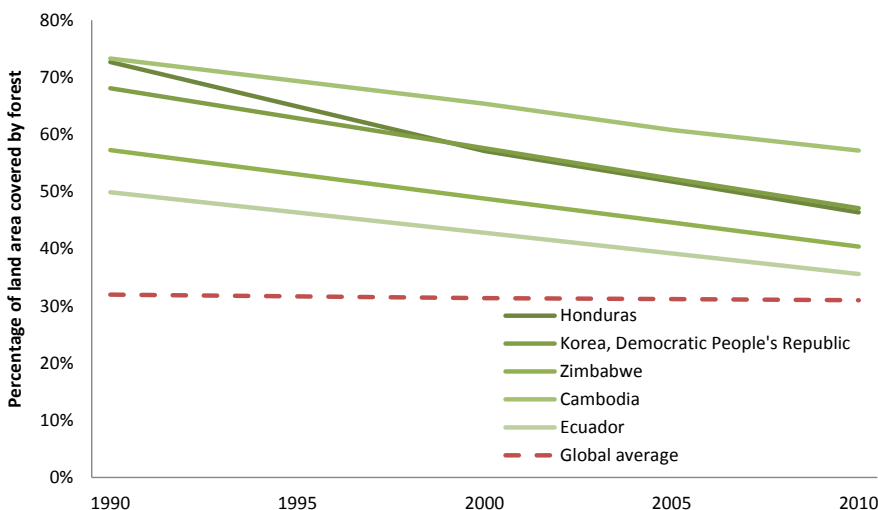


FIGURE 3. HIGHEST DEFORESTATION RATE (PER CENT) BETWEEN 1990 AND 2010 IN COUNTRIES WITH A POPULATION HIGHER THAN 5 MILLION

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

varied only slightly between 1990 and 2010. Forest cover increase higher than 3 per cent was identified in only 30 countries, while less than 3 per cent increase or stagnation was observed in 104. With regard to deforestation, less than 3 per cent was measured in 41 countries, while in 49 countries the deforestation rate was between 3 per cent and 26 per cent.

The observed deforestation trends are a result of several drivers that are changing over time. The earlier pattern of deforestation, characterized mainly by government-assisted land clearing by small-scale farmers, has now changed, and since the 1990s deforestation is increasingly driven by large-scale, better capitalized ranchers who clear the land for cattle ranching or forest plantations (Rudel, Defries, Asner, & Laurance, 2009). Globalization-driven demand for timber doubled in terms of value during the first decade of the new millennium from around US\$320 billion in 1999 to nearly US\$620 billion by 2008, with a structural shift to secondary wood products (Food and Agriculture Organization of the United Nations [FAO], 2015). There are major regional differences in terms of forest cover trends, with Asia, Africa and Latin America experiencing most of the deforestation. Yet data is fraught with uncertainties in monitoring, especially when it comes to taking forest regeneration into account (Grainger, 2008).

There are several international financial instruments, including official development assistance (ODA), and private conservation funds that can support afforestation and sustainable forest management in regions that experience rapid loss of forest areas. Within the framework of the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) an initiative was launched to provide financial and technical assistance to forest conservation programs in pilot countries. At the same time, government funding is very limited in many of the most seriously affected countries (ECOSOC, 2013). Voluntary standards have become more common, and the value of community forestry is increasingly recognized (Auld, Gulbrandsen, & McDermott, 2008). However, as illustrated by overall global trends for Target 7.A, none of these mechanisms seem to have been sufficient to counteract the effects of growing demand for wood products and forest land for farming, settlements and infrastructure.

Most of the drivers behind deforestation and land cover change (such as population and economic growth) are manifested on a long-term scale. Short-term measures should focus on making better use of already existing mechanisms that hold back deforestation, such as the enforcement of protected area status, strengthening the enforcement of forest conservation clauses in investment treaties, and ensuring those currently being negotiated set clear and enforceable conservation rules. Measures that promote forest conservation could be accompanied by holding back those that incentivize deforestation, such as subsidies for land clearing, tax breaks and forest concessions in sensitive areas. Short-term measures can also include preparing the ground for longer-term action that would more effectively address the institutional failures that contribute to forest loss, such as through REDD+ and other similar mechanisms. These should include: looking at improving the legal and policy aspects of forest governance at the national level; discontinuing perverse policies and developing cross-sectoral strategies; and, looking ahead, assessing the required investments in the institutions and institutional capacities of forest management and the sources of such investments (Gregersen, Lakany, Karsenty, & White, 2010). These aspects can also be considered for defining forest management-related indicators for the post-2015 period and the SDGs.

7.2 Carbon Dioxide Emissions

The global level of carbon dioxide emissions from fossil fuels has significantly increased between 1990 and 2010, from 21,550 to 31,387 million tonnes/year (UN, 2013b). Although developed regions—the biggest emitters of fossil fuels—reversed this trend and achieved a 4 per cent decrease between 1990 and 2010, emissions tripled in many of the rapidly developing regions of the world, such as Southeastern Asia. While the developed regions were responsible for 69 per cent of global emissions in 1990, their share was reduced to 43 per cent by 2010.

During the same period, average per capita emissions have also been rapidly increasing in developing regions (from 1.66 to 3.16 tonnes/person/year). Although this indicator shows a decreasing tendency in developed regions (from 12.37 to 10.9 tonnes/person/year), it is still considerably higher compared to developing regions. With regards to emission intensity, the global average decreased from 0.6 to 0.49 kilograms/GDP (adjusted for purchasing power parity [PPP]). While this meant a significant decrease in the developed regions from 0.58 to 0.37 kilograms/GDP (PPP), in developing regions intensity only decreased from 0.63 to 0.47 kilogram/GDP (PPP).

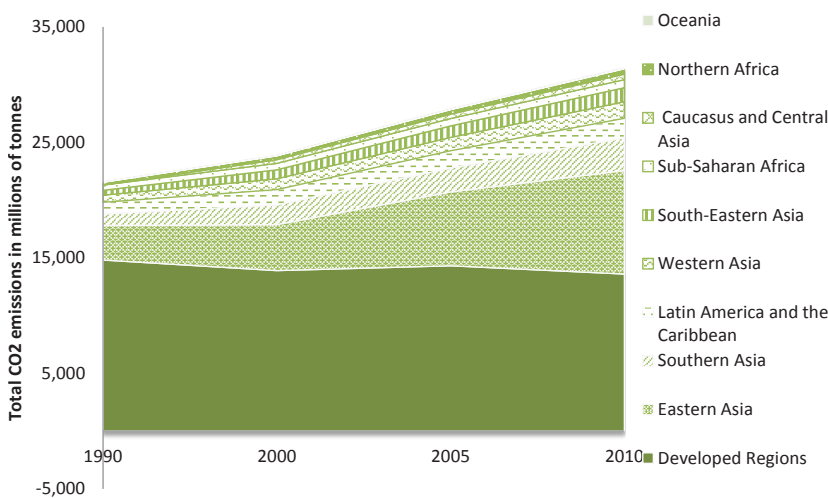


FIGURE 4. TOTAL CARBON DIOXIDE EMISSIONS (MILLIONS OF TONNES) BASED ON THE UN MDG INDICATORS DATABASE CALCULATIONS FROM THE UNITED STATES CARBON DIOXIDE INFORMATION ANALYSIS CENTER (CDIAC)

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

While global average per capita emissions have decreased from 6.44 to 5.66 tonnes, at the national level the changes in emissions varied. A rapid increase can be observed in countries such as in Qatar and Kuwait, where per capita CO₂ emissions were already high in 1990 with 24.85 and 23.1419 tonnes per capita respectively, and further increased over the next two decades to 40.1 and 34.23 tonnes per capita respectively. In Oman per capita emissions were around the global average in 1990 (4.75 tonnes per capita) but by 2010 tripled, reaching 20.5 tonnes per capita. The chart below shows countries which experienced the highest per capita increase with a population higher than one million.

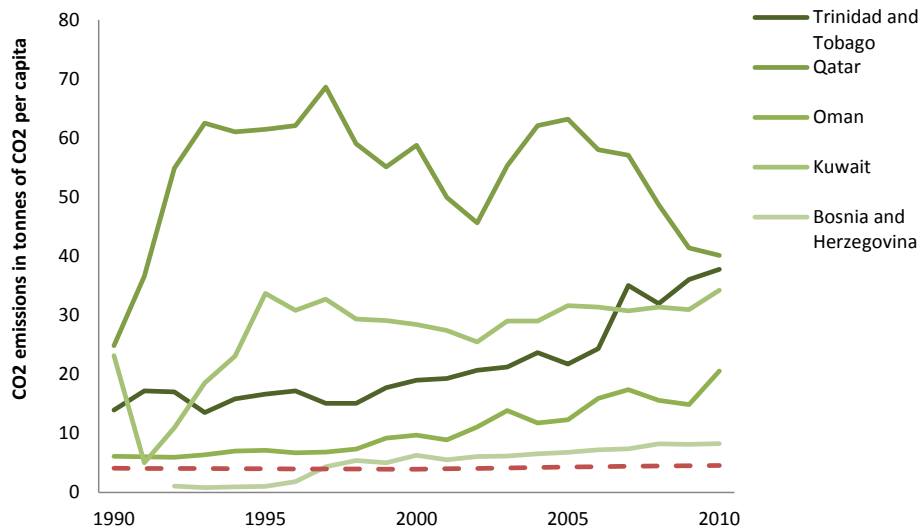


FIGURE 5. HIGHEST INCREASE IN CO₂ EMISSIONS PER CAPITA IN COUNTRIES WITH A POPULATION HIGHER THAN 1 MILLION (TONNES OF CO₂) BASED ON THE UN MDG INDICATORS DATABASE CALCULATIONS FROM CDIAC

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

On the positive side, although for different reasons, some countries achieved significant decreases in per capita emissions: Singapore reduced its emissions per capita by 83 per cent, while the Czech Republic and Ukraine halved their per capita emissions between 1990 and 2010, reaching 10.65 and 10.55 tonnes per capita respectively, due to the collapse and then restructuring of their national economies in the post-Soviet era.

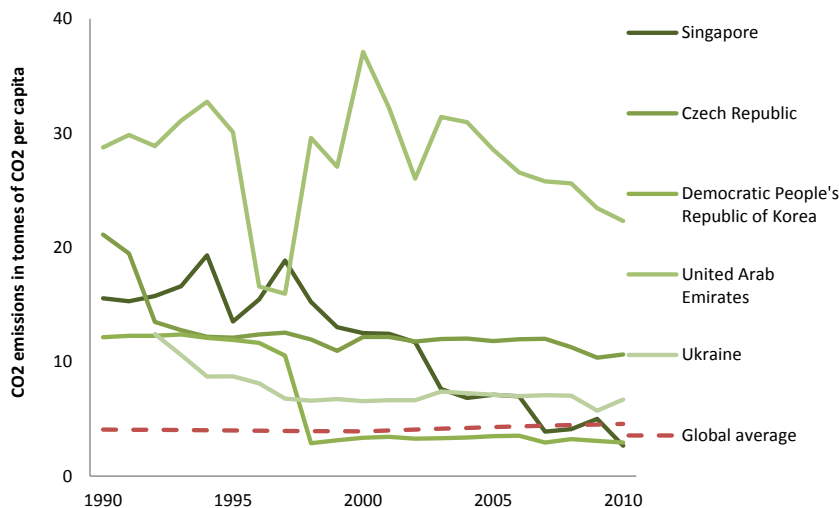


FIGURE 6. HIGHEST CARBON DIOXIDE EMISSIONS PER CAPITA REDUCTION IN COUNTRIES WITH A POPULATION HIGHER THAN 1 MILLION (TONNES OF CARBON DIOXIDE) BASED ON THE UN MDG INDICATORS DATABASE CALCULATIONS FROM CDIAC

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

In terms of per capita emissions change, the indicator shows a decrease of more than 1 tonne per capita in 38 countries, while in an additional 38 countries emissions have decreased by less than 1 tonne per capita. In 87 countries the emissions per capita increased, but the increase was bigger than 1 tonne per capita only in 48 countries.

In terms of emissions intensity, 110 countries reduced emissions per unit of economic product (GDP), but a majority of these countries experienced only slight improvements. Emission intensity increased in 71 countries, but the increase was not bigger than 0.4 kg carbon dioxide per \$1 GDP (PPP). The intensity of carbon dioxide emissions have considerably decreased in the countries of the former USSR, most of Central and Eastern Europe and China, reaching around 1 kg carbon dioxide per \$1 GDP (PPP) on average.

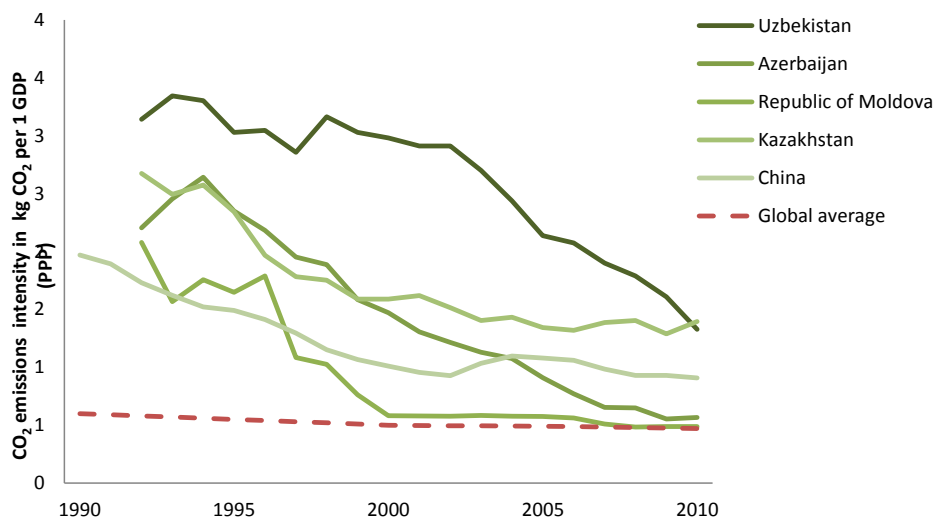


FIGURE 7. HIGHEST DECREASE IN CARBON DIOXIDE EMISSIONS INTENSITY IN COUNTRIES WITH A POPULATION HIGHER THAN 1 MILLION (KG CARBON DIOXIDE PER \$1 GDP IN PPP) BASED ON THE UN MDG INDICATORS DATABASE CALCULATIONS FROM CDIAC

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

CASE STUDY: SINGAPORE

In Singapore, despite the rapid increase in GDP (from US\$11,800 to US\$42,700 per capita) and fast population growth (from 3.04 to 5.07 million) between 1990 and 2010, the country managed to decouple its carbon dioxide emissions during the same period, reaching a significant decrease in per capita emissions from 15.56 to 2.65 tonnes of carbon dioxide and emissions intensity from 0.61 to 0.05 kg/GDP in PPP. This achievement was reached through multiple measures.

The Government of Singapore enacted the National Climate Change Strategy, which was aimed at promoting clean energy, reducing energy intensity, and coordinating policy in order to reduce emissions nationwide. Despite an annual GDP growth rate of 10 per cent in per capita terms since 1971 and growing energy consumption, carbon dioxide emissions per capita have been declining since the 1990s (Asian Development Bank Institute [ADBI], 2013). As an island country, nearly all of Singapore’s fuel and energy needs to be imported. The nation has made a rapid transition from oil to natural gas, with natural gas now constituting around 80 per cent of the electricity-producing fuel mix, up from 19 per cent in 2000. The government is also actively investing in solar energy research and development, with aims of making Singapore a clean energy hub. Competition in the energy sector, through the National Energy Market in Singapore (NEMS), has increased power efficiency and has spurred investment in cleaner fuels. Measures to increase energy efficiency have also been enacted through the national Energy Efficient Program Office (National Climate Change Secretariat [NCCS], 2013), which sets standards for the power generation, transport, industry, and building sectors. 2013’s Energy Conservation Act will introduce more stringent monitoring of energy use in the industry sector. Finally, Singapore has enacted an approach to coordinate energy and climate policy across the many government actors working on the issue. The interagency Energy Policy Group (EPG), established in 2006, is responsible for formulating energy strategies, as well as studying issues such as climate change, economic competitiveness, and international energy partners. Representatives of 11 different ministries, agencies, and authorities sit on the EPG, and are responsible for coordinating this “whole-of-government” approach to energy and emissions (Low Carbon Singapore, 2009).

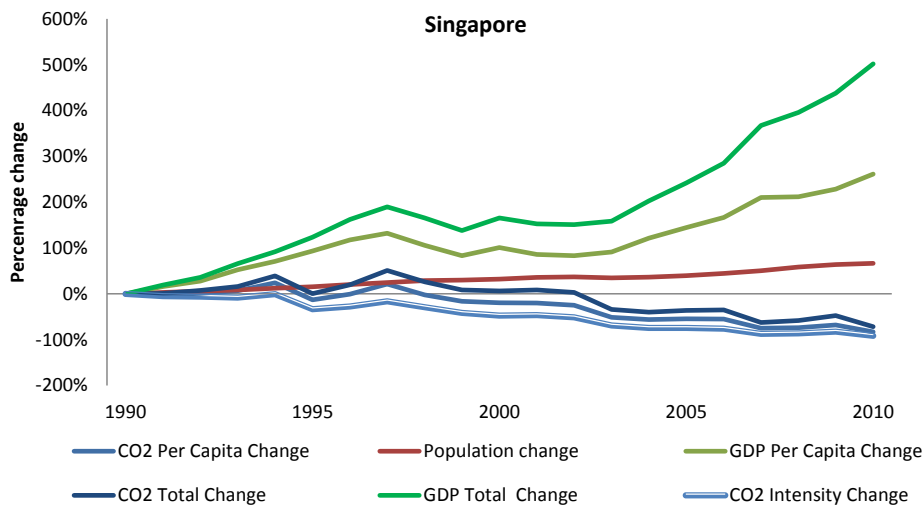


FIGURE 8. PERCENT CHANGE OF TOTAL GDP, GDP PER CAPITA, TOTAL CO₂, CO₂ PER CAPITA, CO₂ EMISSIONS AND POPULATION OF SINGAPORE BETWEEN 1990-2010

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

Although the Kyoto Protocol entered into force in 2005 and was signed by 182 countries, greenhouse gas emissions have continued to increase at the global level (Intergovernmental Panel on Climate Change [IPCC], 2013). Despite initiatives such as the establishment of UNEP-UNIDO National Cleaner Production Centres in developing countries

(UNDG, 2010) and ambitious commitments such as the 2020 emission reduction targets of the European Union (for a 20 per cent reduction in greenhouse gas emissions, along with a 20 per cent increase in energy efficiency and the use of renewables), emissions in the absolute sense continued to increase. Crises such as the collapse of the Soviet Union in the early 1990s, and to a smaller extent (but in a wider range of countries) the global financial crisis of the late 2010s, dampened the growth in emissions, but no persistent trend reversal has been achieved. Without a major and greatly accelerated change in policy and enforcement, greenhouse gas emission reduction in absolute terms will remain a challenge for the coming decades, unless the rate of success of emission reduction efforts is significantly higher than the rate of economic growth and the levelling off (and then decline) of emissions starts as soon as possible. From the climate system stability point of view, it is absolute emission reduction that matters. It is important to note that 70 per cent of total emissions originate from the top six emitters: China, the United States, the European Union with its 27 member states, India, Russia, and Japan (PBL 2012), and therefore mitigation efforts should be accelerated in those where the total emissions are the highest.

To reach Kyoto Protocol targets, stronger and more coherent international cooperation would be needed, along with the greater involvement of different stakeholders and the more efficient application of a combination of innovative measures, including awareness raising, capacity building, market mechanisms, and technology transfer (UNDG, 2010). In order to ensure acceleration of progress toward climate mitigation goals—that first requires the deceleration of trends that take us further away from the goals—and keep the average global temperature increase below 2 degrees Celsius, the United Nations Framework Convention on Climate Change (UNFCCC) and the MDG implementation framework should be brought closer so the fragmentation of the institutional framework for climate change is reduced (Young, 2011) and a global, legally binding agreement can be signed in 2015 (UN, 2013). As a first step, practical, results-oriented initiatives should be promoted in the area of climate adaptation and green growth (Young, 2011). Additionally, in order to scale-up climate financing, the 2013 Work Program of the UNFCCC called for yearly investment of US\$100 billion into low-carbon initiatives by 2020. Aspects of climate financing are further discussed in Chapter 5.

In the context of the MDGs, which at the core are about development, the indicator of carbon dioxide emissions demonstrates a perverse relationship between economic growth and greenhouse gas emissions; within the traditional development pathway, both factors must rise alongside one another. Yet within a sustainable development pathway, the decoupling of growth from greenhouse gas emissions must be achieved in order to allow absolute reductions in greenhouse gas emissions. Clearly, without integrating efforts on climate mitigation with equity in mind into the broader post-2015 development agenda in all sectors related to production and consumption, economic growth will simply continue to undermine the achievement of sustainable development goals.

7.3 Consumption of Ozone-Depleting Substances

The Montreal Protocol that entered into force in 1989 resulted in the almost total phase-out of conventional ozone-depleting substances (ODSs) within two decades (World Bank, 2009a), and today almost 98 per cent of harmful ODSs (which not only damage the ozone layer, but also contribute to climate change) have already been eliminated. Although some new risks have been identified, according to some earlier estimates, the ozone layer is expected to recover by the mid-21st century (World Bank, 2009; Chasek et al., 2010; Eyring et al., 2007). The new risks are related to the discovery of several new types of ozone-depleting substances in the atmosphere (Laube et al., 2014).

As the table below shows, 75 per cent of ODSs were consumed in developed regions, and only Eastern Asia and Latin America and the Caribbean had relatively high amounts of ODS consumption in 1990. By 2012, the developed regions had almost entirely eliminated their use of ODS, while the developing regions went 86 per cent below their 1990 baseline.

TABLE 2. ODS EMISSIONS, TONNES/YEAR

	1986	1990A	2000	2012
World	1,774,954	1,211,193	263,241	44,167
Developing regions	285,496	241,670	209,605	41,023
Northern Africa	14,214	6,203	8,129	963
Sub-Saharan Africa	36,408	23,451	9,597	1,677
Latin America and the Caribbean	78,663	76,048	31,104	5,166
Eastern Asia	103,445	103,217	105,762	23,702
Southern Asia	13,473	3,338	28,161	2,448
Southern Asia excluding India	6,159	3,338	9,466	810
Southeastern Asia	17,926	21,108	16,831	2,902
Western Asia	21,254	8,258	9,891	4,144
Oceania	113	47	129	20
Caucasus and Central Asia	11,607	2,738	928	51
Developed regions	1,477,850	241,670	262,313	3,094

* (NB: negative consumption values occur when there is destruction of ODS using approved technologies)

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

Since the implementation of the Montreal Protocol resulted in almost complete elimination of ODSs, the major consumer countries showed the biggest improvement in terms of total reduction of ODSs. These are the European Union, United States, Russian Federation, Japan, Republic of Korea, China, Brazil, Mexico, South Africa, and Canada.

Success factors in the implementation of the Protocol include the binding nature of the agreement, technology transfer and financial assistance to developing countries and countries with economies in transition, and the universal ratification of the Protocol. Under the protocol, all countries were required to develop ODS management policies and to implement ODS licensing systems in order to meet and maintain their reduction targets. In developing countries, with the creation of a multilateral fund in 1992, a large number of individual projects were supported to develop and introduce environmentally friendly ODS substitutes. To ensure and monitor country compliance and provide support in cases of non-compliance, in 1990 the interim non-compliance procedure was established and an implementation committee was introduced and eventually established on a permanent basis in 1992. Developing countries were supported in the adoption of the regulation, with the development of policies and effective implementation by means of targeted assistance provided by 135 national centres. In line with the requirements of the Protocol, signatory countries developed implementation plans but also had the possibility to apply flexible measures for ODS reduction and to apply annually for exemptions for strategically important components where alternatives were not yet available. Finally, scientists, policy-makers and business organizations were all successfully brought together, which was crucial in achieving the targets (UNDG, 2010).

The Montreal Protocol successfully recognized and responded to different country situations, such as those with low and medium-level ODS consumption (World Bank, 2009a). As a result, some low-volume consumption countries (e.g., Sri Lanka and Fiji) moved to the forefront of the ODS policy formulation and application (hence achieving phase-out of specific ODS components).²

CASE STUDIES: UNITED STATES AND FIJI

The United States, a leader in ODS consumption and production, established strict penalties for ODS smuggling in the 1990s. Through aggressive tactics of national coordination, information sharing, training, criminal prosecution, and international cooperation (UNEP, 2013), the country was able to reduce ODS consumption from 232,862 tonnes in 1990, to 1,627.7 in 2010. These U.S. mechanisms for coordination at the national level, between government agencies, and internationally, between countries, can be taken as a model for successful strategies to address smuggling and the illegal ODS trade.

Fiji, though a low-volume consumer (LVC) of ODS, has also put in place stringent policies against smuggling and can serve as a model for LVC countries. By holding individuals and corporations accountable to the 1998 Ozone-Depleting Substances Act through prosecutions of smuggling and illegal ODS consumption in Fiji, the government has been able to deter future crimes (UNEP, 2013). Thus, Fiji has reduced its consumption of ODS to just 14.5 tonnes in 2010.

7.4 Proportion of Fish Stocks Within Safe Biological Limits

At the global level and for international waters, the United Nations Fish Stock Agreement provides the legal basis for the management of commercially valuable fish stocks, while at the sub-global level regional fisheries bodies (RFBs) are responsible. Fisheries are also covered at the international level by the Convention on Biological Diversity's (CBD's) Strategic Plan for Biodiversity for the 2011–2020 period, including the Aichi Biodiversity Targets with a 2020 timeframe. The Aichi Targets address not only the status of biodiversity, but also the drivers of change, broader ecosystem implications, and socioeconomic impacts.

While national data is available and sufficient for the first three 7A indicators, no country-level data is available for the indicator showing the proportion of fish stocks within safe biological limits. According to a UNEP-World Conservation Monitoring (WCMC) report (Bubb et al., 2011) to the CBD Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) in 2011, this indicator applies in areas beyond national jurisdiction and therefore not reported nationally. Therefore this indicator is only examined at the global level.

According to the FAO State of World Fisheries and Aquaculture report, only 10 per cent of the exploited fish stocks are assessed and most of them only on an occasional basis (FAO, 2011a). While more data is available for developed countries' fish stocks in the Northern hemisphere, tropical fisheries are less monitored. Currently, the FAO compiles data on 600 marine fish stocks (FAO, 2011a), and it was concluded that in 2009, 29 per cent of global fish stocks were considered outside the safe biological limits (Biodiversity Indicators Partnership, 2013).

² Answer from K. Nagatani-Yoshida, Policy & Enforcement Officer (Ozone), UNEP Regional Office for Asia and the Pacific to email inquiry.

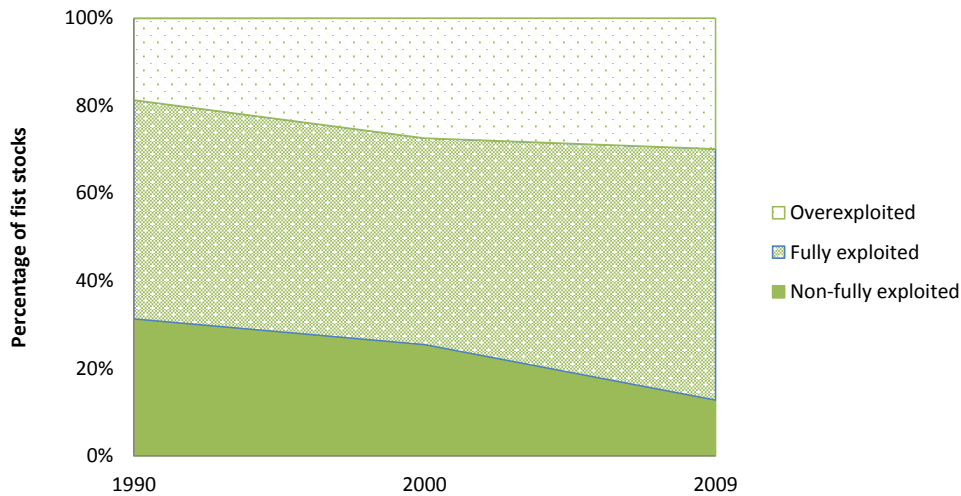


FIGURE 9. PROPORTION OF FISH STOCKS WITHIN SAFE BIOLOGICAL LIMITS (PERCENT)

Source: FAO (2011b).

Fisheries play an important role in ensuring food security as well as securing livelihoods for over 200 million people in the developing world (UNDG, 2010), but due to unsustainable fishing practices, the overexploitation of fish stocks is rapidly increasing (FAO, 2012). The main reasons for overfishing include the overcapitalization of fishing fleets, destructive fishing methods, poor regulation, weak management practices of key fish stock, lack of ecosystem considerations, and inadequate economic instruments (United Nations Development Programme [UNDP], 2012).

Policies effective to improve the sustainability of fishing practices include transferable annual catch quotas, community-based management of small-scale fisheries, assignment of fishing rights to fishing companies, and the development and implementation of clear harvest strategies (UNDG, 2010). However, efforts to rebuild overexploited fish stocks have been insufficient (UNDG, 2010), as according to some studies 20 per cent to 40 per cent of marine areas should be placed under full or partial protection for reversing negative trends, in contrast with only 1.42 per cent that are actually protected (UNDP, 2012). In addition, regulatory and enforcement frameworks are still not sufficiently strong, and should be paired with adequate incentives for conservation measures (UNDG, 2010).

7.5 Proportion of Total Water Resources Used

This indicator is defined as surface and groundwater withdrawal as a percent of total actual renewable water resources available. Approximate calculations exist for 2006, but no time series data for a trend assessment are available.

In 2006 the global average of proportion of total water resources used was 9.2 per cent. The table below shows the regional distribution of water use: it indicates especially high use in Northern Africa, and above 50 per cent use in Caucasus and Central Asia, Western and Southern Asia. This indicates that in 2006 roughly 30 per cent

of the global population was experiencing water stress, as a consequence of excessive water use for agricultural production, population growth, rapid urbanization and climate change (ECOSOC, 2012). More specifically, almost 20 per cent of the world’s population already faces physical water scarcity, and 7 per cent is close to experiencing it. An additional 25 per cent of the population lacks adequate infrastructure to ensure safe and affordable access to water (UN Water, 2012a).

TABLE 3. PROPORTION OF TOTAL WATER RESOURCES USED IN PERCENT IN 2006 OR IN YEAR CLOSEST TO 2006

	PROPORTION OF TOTAL WATER RESOURCES USED AROUND 2006	POPULATION AS PERCENT OF GLOBAL POPULATION
Northern Africa	89%	2.89%
Caucasus and Central Asia	55.1%	0.89%
Western Asia	54.9%	3.35%
Southern Asia	52.9%	24.31%
Eastern Asia	19.8%	23.04%
Developed Regions	10%	15.71%
Southeastern Asia	7.8%	8.63%
Sub-Saharan Africa	3.2%	12.02%
Latin America and the Caribbean	2%	8.62%
Oceania	0.06%	0.53%

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

As for the national-level indicator measuring the proportion of total water resources used, data is available from the FAO AQUASTAT website for 160 out of 190 countries. However, the data coverage is uneven and, where available, in many cases it was reported only once (or two to three times) during the 1990–2010 period; therefore, in many cases only the status of countries can be assessed, but not the progress. The lack of adequate data can be explained by such things as inadequate monitoring, inconsistency in measurement, or national policies that consider water-related data classified (UN Water, n.d.). The figure below shows water resource withdrawal around 2006 and gives an indication of those countries that are under increased water stress.

Proportion of renewable water resources withdrawn: MDG Water Indicator

Surface water and groundwater withdrawal as percentage of total actual renewable water resources (around 2006)

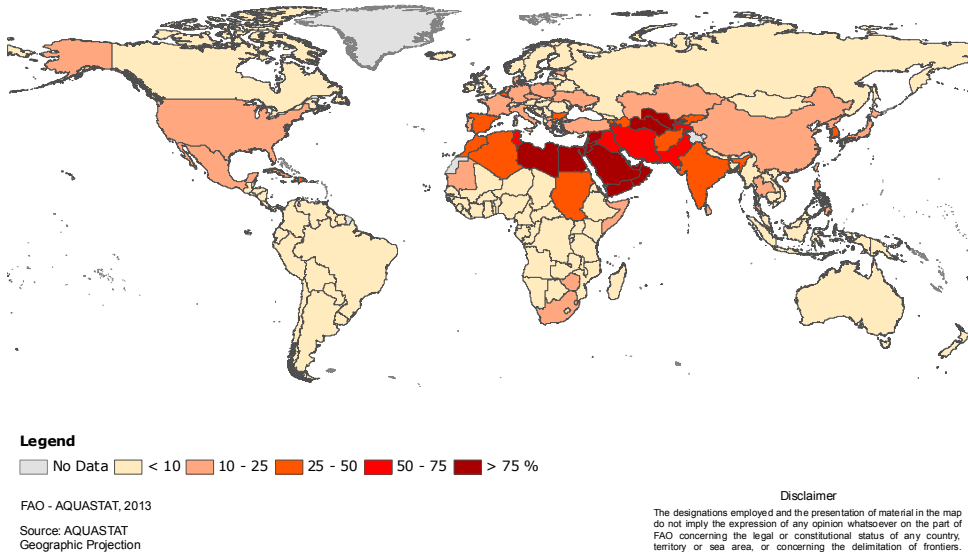


FIGURE 10. MDG WATER INDICATOR AROUND 2006

Source: UN Water (n.d.).

Over the last 50 years, total water withdrawals have tripled (UNEP, 2012). The agricultural sector accounts for 70 per cent of total use, and since an increasing global population will induce further demand for food, efficiency improvements in this sector are crucial. Solutions should be sought, not only in more advanced countries, but also in less developed countries where access to innovative solutions and technologies is limited. In addition, the global population’s increased demand for energy and electricity also puts further pressure on the available water resources and outlines the need for more water-efficient solutions in both the industrial sector and in urban areas (ECOSOC, 2012).

Globally, public investments in water infrastructure have been increasing, but more significantly in countries with high levels of human development (measured by the human development index [HDI]). Countries have prioritized investments in water supply and energy/hydropower plants and put less emphasis on rainwater harvesting and natural water management systems (UN Water, 2012a). To boost investment of water resource management, the role of the private sector in financing is important. For example, microfinancing, when linked to pro-environmental behaviour in agricultural practices, can improve the sustainability of water use and local environmental sustainability (UN-Habitat, 2011). In Bangladesh, training for more sustainable agricultural practices was offered to those supported with microfinancing (UN-Habitat, 2011). In addition, to find innovative, solutions which can reduce externalities more emphasis should be placed on research and development and technology transfer (ECOSOC, 2012). There are many examples of successful technology-transfer initiatives. For example, between 2009 and 2012 a management plan was developed for more sustainable water and agricultural land use in the Guanting water catchment area of the Province of Beijing in China, in collaboration with German partners. The plan adapted approaches in the previously developed GLOWA-Elbe Project in Germany (German Federal Ministry of Education and Research, 2011).

Target 7.B: Reduce Biodiversity Loss, Achieving, by 2010, a Significant Reduction in the Rate of Loss

7.6 Proportion of Terrestrial and Marine Areas Protected

Overall, the proportion of terrestrial and marine protected areas increased from 8.3 per cent to 14 per cent between 1990 and 2012. At the regional level, increases can be observed in all areas. The highest increase was 8.7 per cent to 20.3 per cent in Latin America and the Caribbean, while the lowest increase (from 2.8 per cent to 3.6 per cent) was identified in the Caucasus and Central Asia.

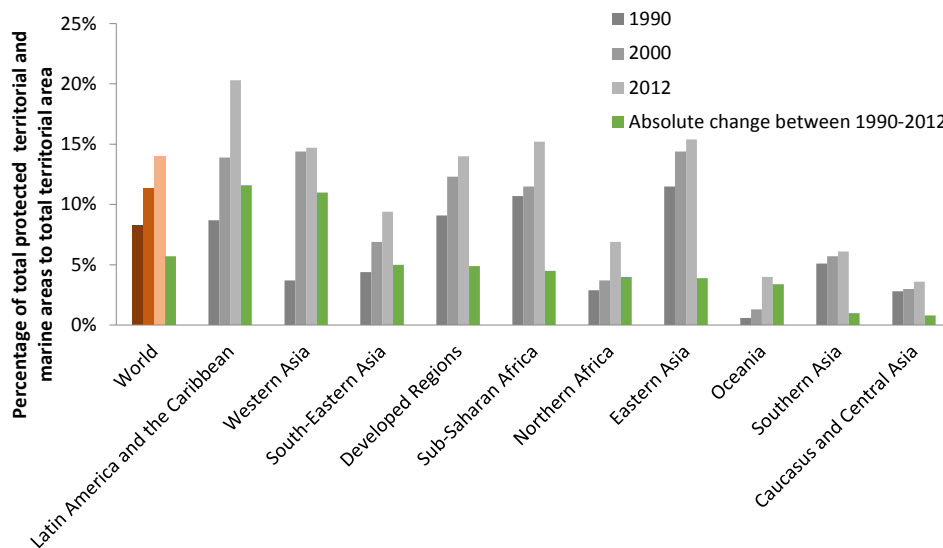


FIGURE 11. PERCENTAGE OF TOTAL PROTECTED TERRESTRIAL AREAS

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

The percentage of total protected terrestrial areas increased from 8.9 per cent to 14.6 per cent between 1990 and 2012 globally, with the highest increase in Latin America and the Caribbean (9 per cent to 21.2 per cent) and Western Asia (4 per cent to 15.7 per cent). In spite of these positive developments, 6 out of the 14 global biomes are failing to meet the relevant Aichi target 11³ and have less than 10 per cent coverage (UNEP, 2012). In particular, the protection coverage of marine areas is failing to meet this target. The percentage of protected marine areas as a percentage of total territorial waters increased only 5 per cent between 1990 and 2010 (from 4.6 per cent to 9.7 per cent) at the global level. More worrisome is that the regional coverage has increased only minimally in Western/Southern Asia and the Caucasus and Central Asia, where marine protected area coverage in 2012 was 1.8 per cent, 1.6 per cent and 0.9 per cent, respectively.

By 2012, 115 countries had protected 10 per cent or more of their surface area and 37 countries placed more than 25 per cent of their total territories under protection. For example, between 1990 and 2012 Slovenia achieved a 40 per cent increase (from 7.46 per cent to 47.4 per cent), while Bulgaria managed a 30 per cent increase, from 1.96 per cent to 35.44 per cent. Namibia already had 11.21 per cent of its territory protected in 1990, which was further increased to 31.37 per cent by 2012.

³ Aichi target 11: Conservation of at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas by 2020.

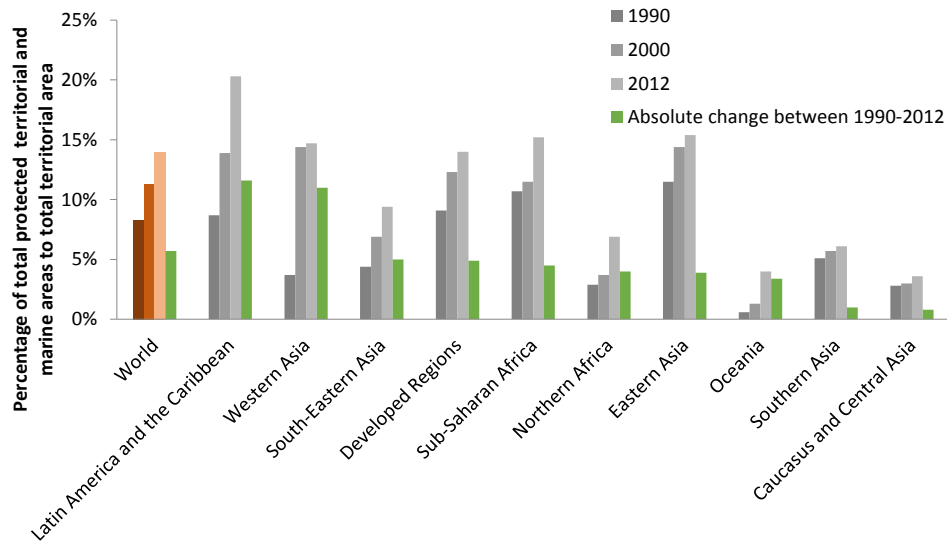


FIGURE 12. COUNTRIES WITH INCREASE IN TOTAL PROTECTED TERRESTRIAL AREAS OVER 25 PER CENT

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

CASE STUDY: NAMIBIA

Namibia was particularly successful in increasing the proportion of protected areas, with 31.37 per cent of its lands protected in 2012, up from 11.21 per cent in 1990. The country achieved this result once it incorporated local conservation rights into its national constitution, after gaining independence from South Africa in 1990 (WWF, 2011). Namibia has also partnered with international organizations such as the World Wildlife Fund and the UN Development Programme to improve policies, local capacity, and financial support for protected areas. Furthermore, by introducing sustainable tourism policies in protected areas, the parks recorded as much as a 23 per cent return on investment for Namibia’s GDP (CBD, 2010).

Success factors in increasing the percent and adequately managing protected areas include ratification of relevant multilateral environmental agreements (MEAs), incorporation of protection areas into the national regulatory framework and national strategies, involvement of local communities, establishment of private protected areas, regional cooperation, and global technical support (UNDG, 2010).

7.7 Proportion of Species Threatened With Extinction

The 2011 UNEP-WCMC report to the CBD Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) (Bubb et al., 2011) stated that the proportion of species threatened with extinction (the Red List Index) is not reported at the national level, as the index relies on repeated assessments that are currently only undertaken globally (CBD, 2011). Extracted from a global list, most countries’ National Biodiversity Strategy and Action Plans (NBSAP) and/or National Report contain a list of the globally threatened species in their national territory. However, this is not the same as a list of nationally threatened species, which requires an assessment that takes the national context fully into account.⁴ National indices derived from a global index are therefore not suitable for national assessments and comparisons.

⁴ Answer from Neil Pratt, Senior Environmental Affairs Officer, Mainstreaming, Partnerships and Outreach, Secretariat of the Convention on Biological Diversity (CBD), United Nations Environment Programme to email inquiry.

Looking at the global picture, the percentage of species that are expected to become extinct in the near future has increased slightly from 7.9 per cent to 8.7 per cent at the global level. The largest increase was recorded in Northern Africa, Western Asia and in Latin America and the Caribbean.

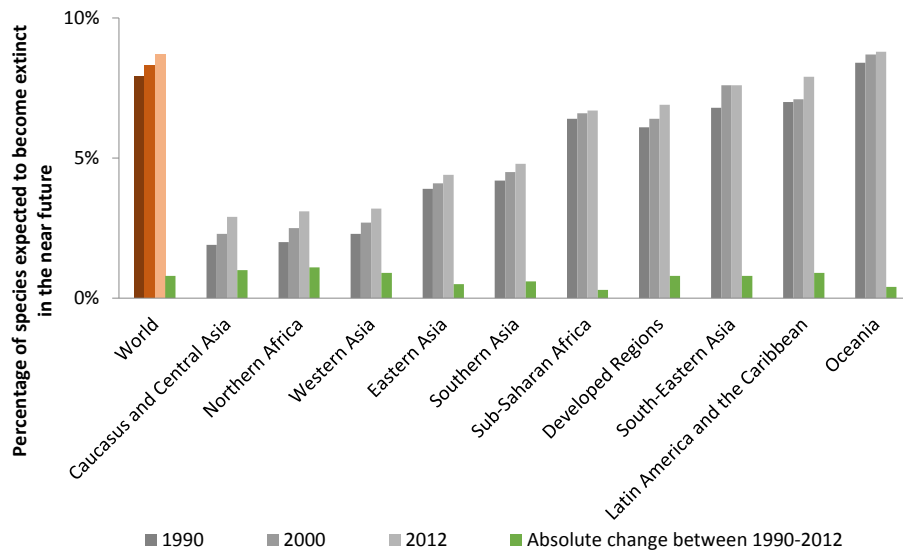


FIGURE 13. PERCENTAGE OF SPECIES EXPECTED TO BECOME EXTINCT IN THE NEAR FUTURE BY REGION

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

The main reasons for this biodiversity loss include habitat loss and degradation, overexploitation of wild species, spread of alien invasive species, climate change, and pollution (UNEP, 2012). The increasing percentage of threatened species indicates that current efforts to reverse these trends are inadequate (UNDG, 2010). This is also confirmed by the comparison of regional performance in the management of protected areas and preservation of endangered species. While the percentage of protected areas has been increasing in all regions, the percentage of species with no extinction risk in the near future is constantly decreasing. The same trend can be observed even in those regions where the percentage of protected areas considerably increased between 1990 and 2010.

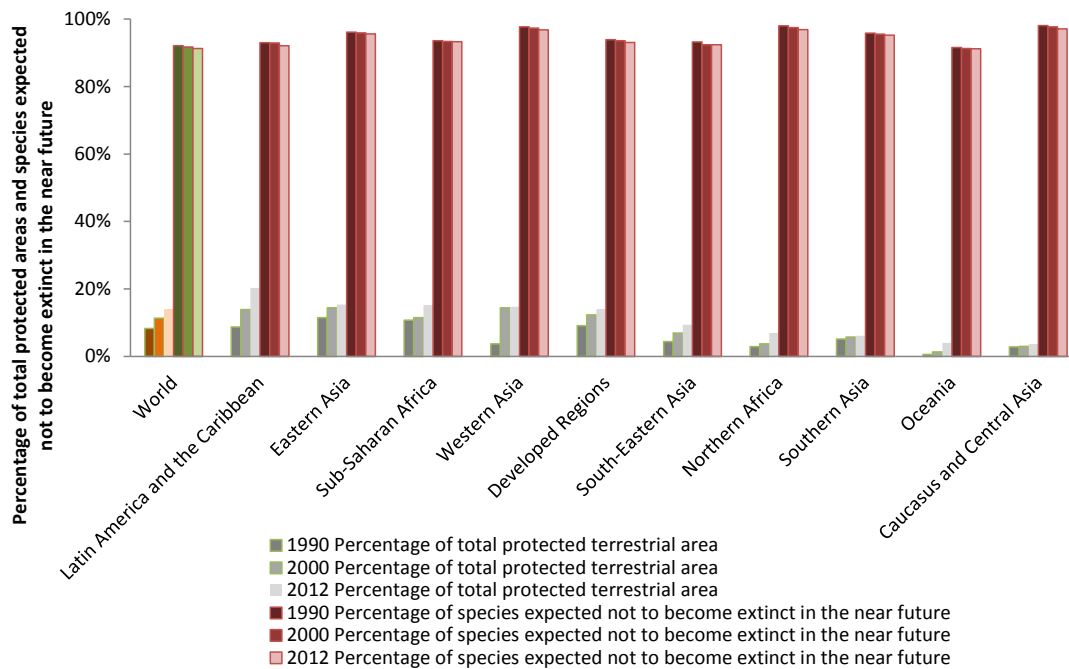


FIGURE 14. COMPARISON OF PERCENTAGE OF TOTAL PROTECTED TERRESTRIAL AREA AND SPECIES EXPECTED NOT TO BECOME EXTINCT IN THE NEAR FUTURE.

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

Although protected areas are found to be important in maintaining species, according to the Alliance for Zero Extinction, half of the sites critical for ensuring the survival of hundreds of highly threatened species fall outside the protected areas (UNEP, 2012). This means that even if protected areas have been increasing in a certain country or region, the key biodiversity hotspots may not have been placed under adequate protection (UNDG, 2010), or have not been managed effectively. As a first step, for efficient protection of threatened species, red-list indicators should be developed and regularly updated at the national level (UNDG, 2010). Secondly, for successful implementation, biodiversity protection efforts should be horizontally included in national policies so that these efforts are not hampered by socioeconomic development (UNDG, 2010). Since the lack of adequate financing for protected areas is a major hampering factor in effective biodiversity protection (International Union for Conservation of Nature [IUCN], 2006), innovative financing approaches should be introduced. These may include diverse external funding sources, cost- and benefit-sharing mechanisms, or resource-use fees and charges. The funding sources should be managed in a cost-efficient manner, and for this the necessary institutional, technical and human capacity should be ensured (IUCN, 2006).

Target 7.C: Halve, by 2015, the Proportion of the Population Without Sustainable Access to Safe Drinking Water and Basic Sanitation

In 2010, the UN General Assembly declared access to water and sanitation as a human right (UNW-DPAC, 2011). Target 7.C reflects the importance of water, sanitation and hygiene, with clear and measurable indicators. Safe water and sanitation facilities have a very strong link to human health, and in the context of the MDGs this target has

deep interlinkages to goals 2, 3, 4, 5 and 6 (universal primary education; gender equality; reducing child mortality; improving maternal health; and combating malaria and other diseases).

Waterborne diseases are one of the leading causes of death worldwide (World Health Organization [WHO], 2013), and reaching MDG Target 7.C is projected to decrease the water-related global disease burden by 10 per cent (UNEP, 2012). Access to clean water supplies, however, is influenced by a multitude of factors, including contamination and extraction of water sources, technological and cultural factors and water policy and politics. Progress toward Target 7.C has been mixed, with more positive performance in access to drinking water than in access to sanitation.

7.8 Proportion of Population Using an Improved Drinking Water Source

The target—to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation—was met by 2010, five years ahead of time (UN, 2012). Considering the global average, the proportion of population using an improved drinking water source increased from 76 per cent to 89 per cent between 1990 and 2011. Progress toward this target has been achieved mostly through the availability and increased use of technology and infrastructure addressing water quality and scarcity (WHO, 2012), with almost half of this global increase due to improvements in China and India (UN, 2012).

The biggest improvements were achieved in Eastern and Southern Asia; however, a negative tendency emerged in the Caucasus and Central Asia. The latter experienced a decline in access to improved drinking water sources: a 1 per cent decline in urban and 2 per cent in rural areas. Poor condition of infrastructure and unreliable water provision are highlighted as key contributing factors (European Environment Agency [EEA], 2011). This trend is likely to worsen if infrastructure maintenance is not given priority, and if the very high rates of water withdrawal continue in the region (EEA, 2011).

By 2015, 92 per cent of the global population is expected to have improved water access if current trends continue (UN, 2012a). However, there are important inequities to note in this global average.

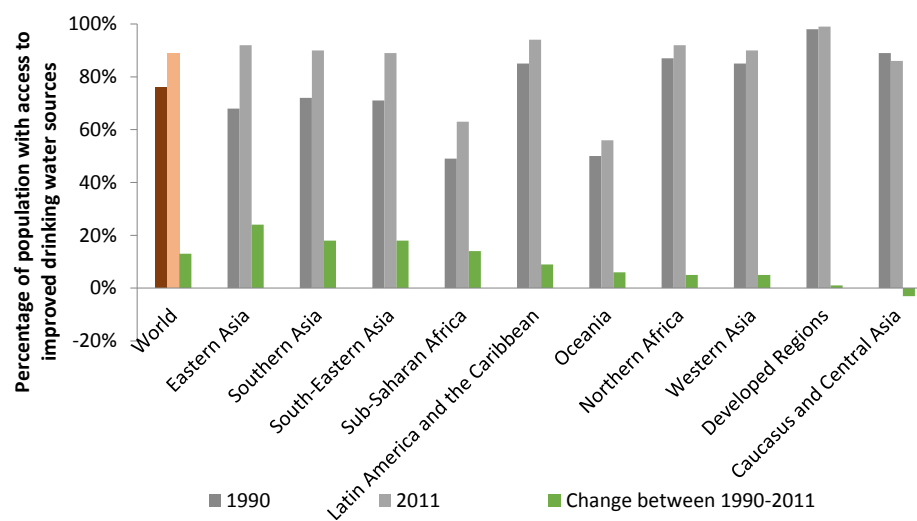


FIGURE 15. PERCENTAGE OF POPULATION WITH ACCESS TO IMPROVED DRINKING WATER SOURCES

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

While most of the improvements are in rural areas (where access increased from 62 per cent to 81 per cent at the global level), they still lag behind urban areas. In 2010, only 4 per cent of urban populations lived without access to improved drinking water: in rural areas this figure was 19 per cent (UNEP, 2012). Also, due to population growth and rural-to-urban migration, in absolute terms the number of people without access to an improved water source in urban areas actually increased, while in rural areas the number decreased (UN, 2012a). By 2015, more than 600 million people will still lack access to clean drinking water (UNEP, 2012). Significant work still remains if this target is to be reached at the regional and national levels, particularly in sub-Saharan Africa, where 40 per cent of people live without access to an improved drinking water source (UNDESA, 2010; UN, 2012b).

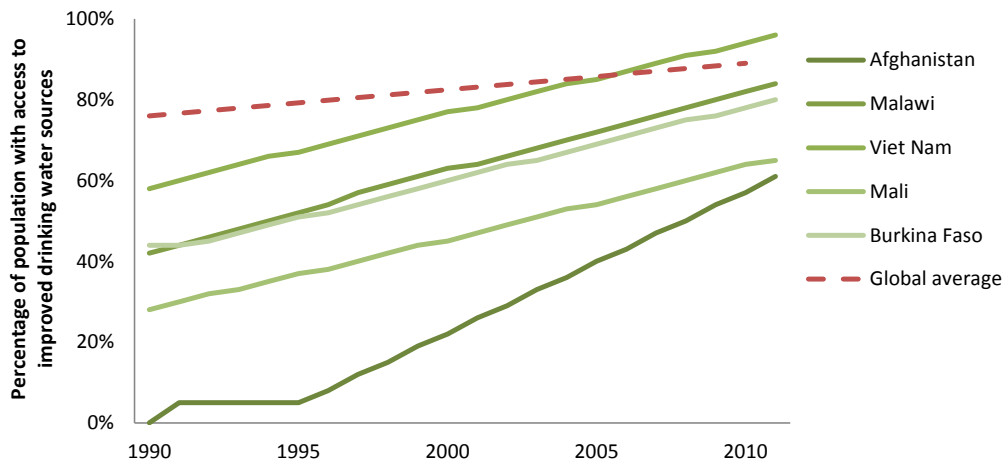


FIGURE 16. COUNTRIES WITH HIGHEST IMPROVEMENT IN PERCENT OF POPULATION WITH ACCESS TO IMPROVED DRINKING WATER SOURCES (WITH POPULATION ABOVE 1 MILLION)

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

Most of the countries that achieved a significant improvement in drinking water infrastructure had very low access rates in 1990 i.e., a very low baseline. In Afghanistan, the access rate was increased from 5 per cent to 61 per cent, and in Mali from 28 per cent to 65 per cent. Despite such improvements, all top performers (except Viet Nam) are still far below the global average. Most of these improvements have been made through investment in new infrastructure development, such as piped water into homes (predominantly in urban areas), the installation of public water taps, boreholes and rainwater collection (Bain, Wright, Yang, Pedley, Gundry & Bartram, 2012). However, it should be noted that “improved water source”—as a proxy indicator for safe water—may actually overestimate the number of people who have access to safe (non-contaminated) water for drinking (UN, 2012a; Bain et al., 2012).

Access to drinking water also has a close relationship with gender equity measures. Women and girls worldwide face the highest burden, due to their daily responsibility for collecting and hauling water required by households, often from long distances. On top of health implications, this task is often a major factor that prevents girls from attending school or engaging in other livelihood activities.

CASE STUDY: BURKINA FASO

Burkina Faso was able to improve rural and urban access to safe drinking water through infrastructure investments, such as the construction of water towers and pipes, in order to provide more affordable water to people (UNDP 2010). Through government reforms, such as water management policies that lowered the cost of connecting urban and rural infrastructure, Burkina Faso has increased the percentage of the country with access to safe drinking water from 44 per cent to 80 per cent.

A 2004 national Decentralization Law gave rural communities greater responsibility for water supply services. Complementary World Bank-funded efforts through the Burkina Faso Urban Water Sector Project have focused on investing in water withdrawal, storage, and distribution in major urban centres (World Bank, 2009b).

Although this target has been met, and could be considered an MDG-7 success story, challenges still remain. In order to achieve the overarching aims of this target—and its relationship with other MDGs—it is still necessary to address two important factors: special focus on those populations that still do not have improved water access (mainly women and rural areas in sub-Saharan Africa); and developing new methods to ensure that “improved” actually means “safe” water access (UN Water, 2013a). Access to safe drinking water and the importance of the specific needs of women has been recognized in the proposed SDG Goal 6 on “ensuring the availability and sustainable management of water and sanitation for all” (UN 2014).

7.9 Proportion of Population Using an Improved Sanitation Facility

Given current trends, it is highly unlikely that the sanitation target will be met, as 2.5 billion people globally still do not have access to improved sanitation facilities (UN, 2012a). Between 1990 and 2010, access to improved sanitation facilities—such as a septic tank, pit latrine, and flush or composting toilets—increased by 15 per cent globally. In the developing world, only 56 per cent of the population had access to improved sanitation by 2010, well below the 2015 target of 75 per cent (Oxfam, 2013). From the regional point of view, more improvement was achieved in Eastern Asia (40 per cent) and Southeastern Asia (24 per cent). Progress was also recorded in Southern Asia (17 per cent), but the access rate in 2010 was still below the global average (41 per cent). In sub-Saharan Africa, only 30 per cent of the population had access to improved sanitation in 2010, and only a 4 per cent increase was reached over the 20 years since 1990. As in the case of drinking water infrastructure, most improvements on a percentage basis were reached in rural areas.

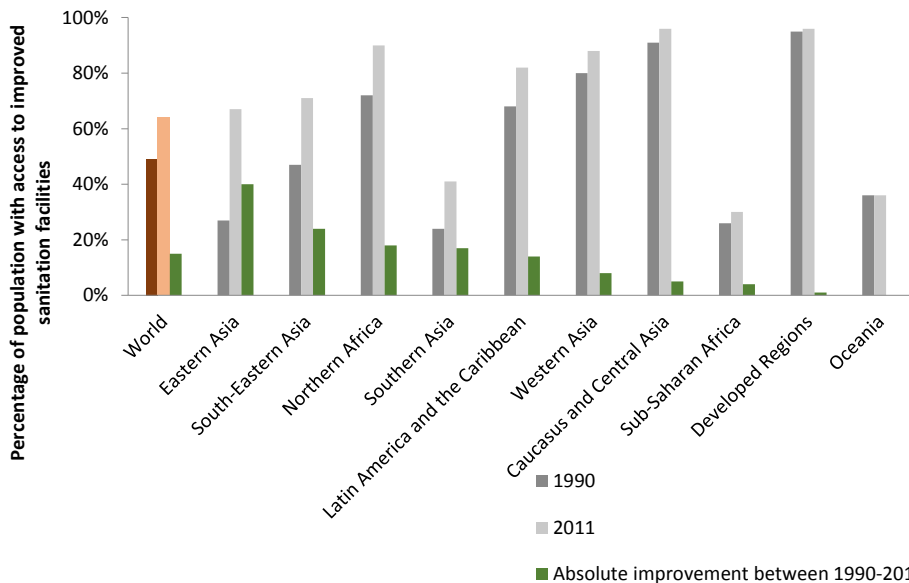


FIGURE 17. PERCENT OF POPULATION WITH ACCESS TO IMPROVED SANITATION FACILITIES

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

In some countries the improvement was much faster than the global rate. For example, Lao PDR achieved a 40 per cent increase from 1995 to 2010, and reached 59 per cent in 2010. In China, the access rate in 1990 was only half of the global average (49 per cent), but due to a more than 30 per cent increase, the country reached and exceeded the global average (64 per cent) in 2010. Vietnam and Paraguay were at 37 per cent and 38 per cent in 1990, respectively. By 2010 they were well above the global average, 73 per cent and 71 per cent respectively. However, such country-level improvements do not account for rural-urban and rich-poor differentiation, as evidence shows that such sanitary improvements are highly correlated to wealth and residence (UN, 2012a). These sanitation improvements are therefore largely bypassing the poorest households, particularly in rural areas.

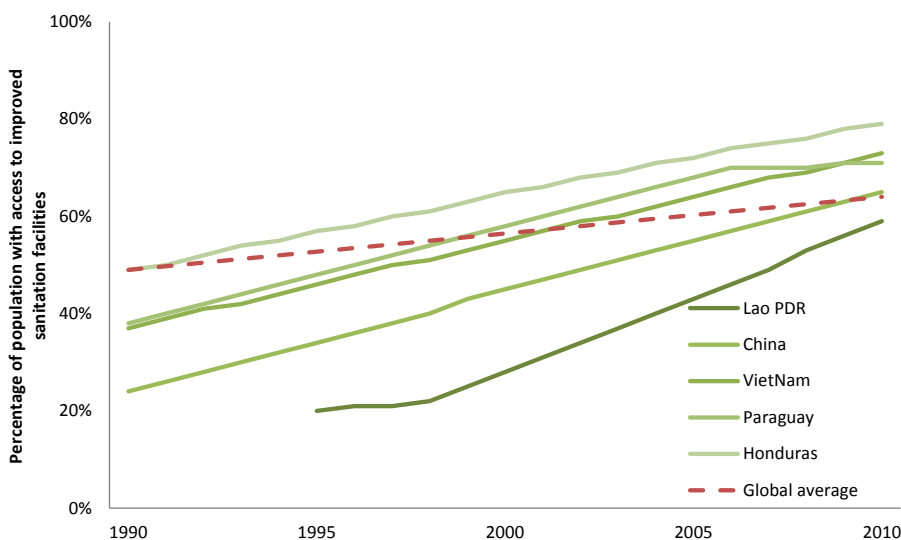


FIGURE 18. COUNTRIES WITH FASTEST IMPROVEMENT IN SANITATION ACCESS (&)

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

Despite significant improvements at the country level, as shown above, lack of access to sanitation facilities is still a major challenge and human health hazard at the global level. Each year, 3.5 million people die from water-related diseases (UNEP, 2012). This number could be significantly reduced through improved access to and use of basic sanitation facilities. Worldwide, 1.1 billion people (15 per cent of the human population) do not have access to sanitation, and mostly resort to open defecation (UN, 2012a). Along with improper agricultural practices, this is a major cause of microbial contamination of water, and a leading cause of disease and death. Installation of improved sanitation facilities must therefore be coupled with adequate wastewater treatment facilities, in order to avoid unintended negative consequences such as further contamination of downstream water (Biswas & Tortajada, 2011).

The global burden of disease due to unsafe and unsanitary water facilities is of particular concern, and requires integration of both water management and public health measures. The major drivers in this area are complex and involve various social, economic and environmental factors, including direct and indirect drivers such as population growth, urbanization, agriculture, infrastructure and climate change (ECOSOC, 2012). Adequately addressing Target 7.C, in the remaining MDG implementation period as well as in preparation of the SDGs, requires a concerted effort to identify and address these interlinkages through joint and mutually reinforcing interventions.

With regard to the post-2015 period, complementing the target(s) for universal access to safe and sustainable water supply with target(s) for sanitation and hygiene, waste water, improving water use efficiency and integrated water resources management are have been suggested (UN, 2014).

The chart below shows that between 1990 and 2012 access to improved drinking water sources and sanitation facilities improved at the global level and—except in the Caucasus and Central Asia and Oceania—in all regions of the world. At the same time, it also shows that most regions, especially those that experience high population growth, have a considerably lower percentage of population with access to sanitation than to clean drinking water. If this gap cannot be narrowed in the near future, the integrity of aquatic ecosystems will continue to be at high risk, with a consequent high risk for water supplies that will ultimately also affect water for human consumption. For example, the lack of sanitation and poor hygiene typical of slums can easily undermine the health benefits achieved by improved access to drinking water. Poor sanitation and contaminated effluents may also pollute terrestrial and marine ecosystems, representing a further risk to human well-being through the food chain (UN Water, 2013).

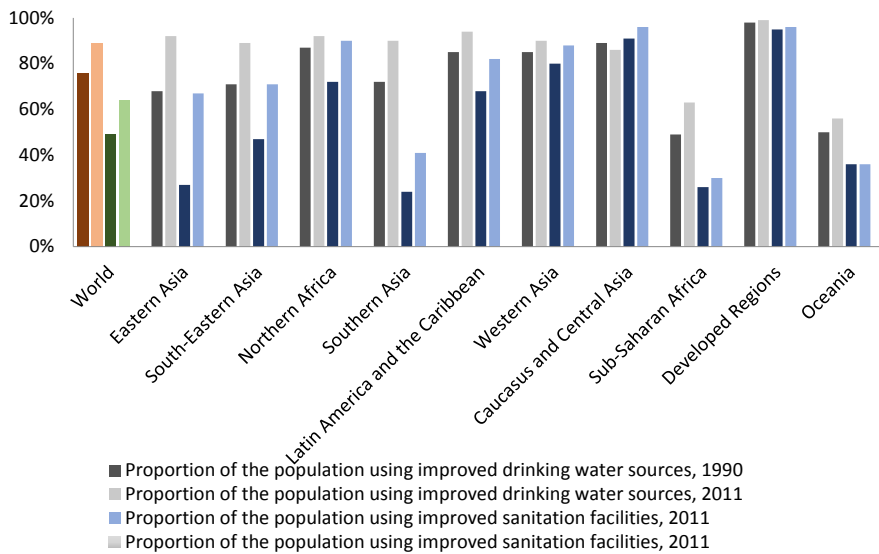


FIGURE 19. COMPARISON POPULATION USING IMPROVED DRINKING WATER SOURCES AND SANITATION FACILITIES (%)

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

Target 7.D: Achieve, by 2020, a Significant Improvement in the Lives of at Least 100 Million Slum Dwellers

7.10 Proportion of Urban Population Living in Slums

Between 1990 and 2012, the proportion of population living in slums decreased in all regions except Western Asia. The biggest improvement can be observed in Southern Asia (22 per cent) and Northern Africa (21 per cent). However, in sub-Saharan Africa, where 70 per cent of the population lives in low-income settlements and poor human living conditions, only an 8.3 per cent improvement was recorded. However, in spite of positive trends, the number of people living in slums increased from 650 million in 1990 and 760 million in 2000 to 863 million in 2012 (UN-Habitat, 2012).

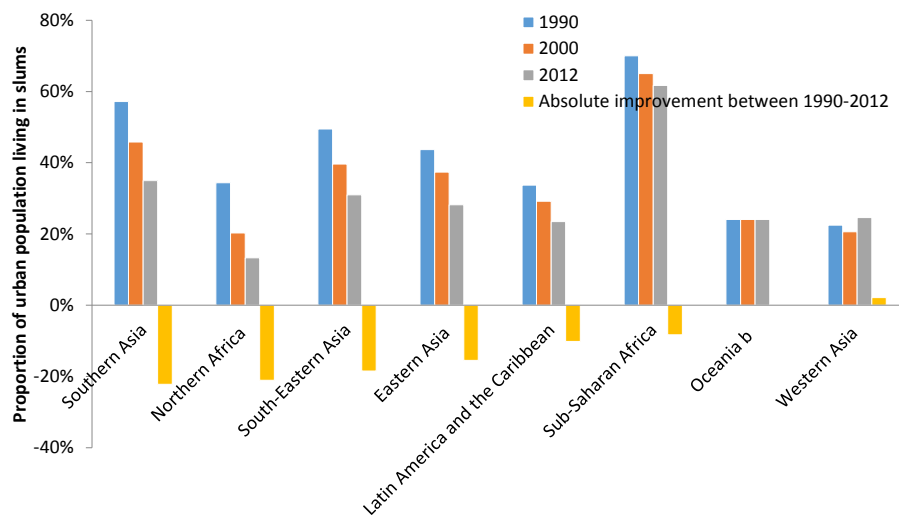


FIGURE 20. PROPORTION OF POPULATION LIVING IN SLUMS, BY REGION (%)

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

Progress at the national level cannot be evaluated comprehensively, as many of the countries report data only for one year. Out of those 59 countries where data is available for several years, Nicaragua and Guinea achieved a reduction in slum dwellers from 89 per cent to 45 per cent and 80 per cent to 45 per cent, respectively. Egypt, where the proportion of slum dwellers was above 50 per cent in 1990, reached a 33 per cent decrease by 1990. Most countries (46) achieved some progress in reducing the percentage of slums, but Zimbabwe, Thailand and Iraq recorded an increase in the 20 per cent to 30 per cent range.

CASE STUDY: SENEGAL AND EGYPT

In Senegal, the government introduced new land policies focused on reform and regularization of the land, along with enacting “slum-upgrading” efforts. The Senegalese 10-year action plan, “Villes sans Bidonvilles,” include objectives to monitor and evaluate progress, mobilize public and private funds, and strengthen government capacity to upgrade slum conditions (Cities Alliance, 2011).

Upgrading initiatives by the Egyptian government have focused not only on the upgrade of physical space, but also on socioeconomic issues such as health and gender equality. By discussing and agreeing upon policies with local stakeholders, Egypt and its international donors were looking to increase the accountability and transparency of slum upgrade projects (UN-Habitat, 2013a).

The UN-HABITAT-led Participatory Slum Upgrading Programme, which includes the Egyptian project, began implementation in 2012. Though its effects have not yet been captured in country data, it represents international resource mobilization that will benefit the government’s on-going slum-upgrading efforts (UN-Habitat, 2012).

Slums are the result of various factors such as rapid rural-to-urban migration, lack of secure tenure, and negative effects of globalization, such as the increased demand for unskilled labour (UN-Habitat, 2007). While this MDG target foresees improvement in at least 100 million people’s living conditions by 2020, in absolute terms the number of people living in slums is rapidly increasing. In 2012, over 850 million people lived in slums (UN, 2013) and by 2030 the number of people living in slums could top two billion people (UN-Habitat, 2005). The rapid increase of slum dwellers can be directly linked to accelerated urbanization in developing countries. Since it is foreseen that over 70 per cent of the global population will live in cities by 2050 (UN, 2013), an increasing number of cities will face problems related to inadequate city planning which may in turn hamper efforts to improve the living conditions of the poor.

To achieve progress, many countries consider slum-upgrading programs, which may involve the introduction of poverty-related regulations, community and infrastructure development, housing, service and environmental improvements (UN-Habitat, 2007). Improvements in infrastructural may target drinking water, sanitation, drainage or electricity facilities, while environmental improvements may include arborization, reforestation, environmental restoration and mitigation. As part of community development, sanitation and environmental education can also be considered. In order to provide assistance to national and local governments and non-governmental organizations to implement such slum-upgrading programs, UN-Habitat established a Slum Upgrading Facility in 2004 (UN-Habitat, 2007). Through the program, Local Finance Facilities have also been established to support low-income populations in access to credit for sustainable and affordable housing. The initiative aims to reach 10,000 households by 2014 in Ghana, Indonesia, Sri Lanka and Tanzania (UN-Habitat, 2013b).

2.0 Exploring the Drivers of MDG-7 Trends: Economic growth, demographic changes and carbon dioxide emissions

The principal drivers of environmental trends are climate variability, population and economic growth. Historically, population and economic growth have been closely coupled with the increase of environmental pressure at the global level. However, if we take carbon dioxide emissions as a key global environmental issue, one also finds examples of successful decoupling. This section reviews economic, population and emissions trajectories in the Republic of Korea and Norway, two countries where emissions have been successfully or less successfully decoupled from economic and population growth.

Norway was not successful in decoupling carbon dioxide emissions from rapid economic growth. Between 1990 and 2010, per capita GDP skyrocketed from US\$27,700 to US\$86,200 per capita, while the population increased slightly. Total carbon dioxide emissions followed the trajectory of economic growth, and even increased. The economic crises experienced in 2008 and 2009 not only reduced the country's economic performance, but also led to a sharp decrease in carbon dioxide emissions. Following the economic crisis, carbon dioxide emissions have started rising again. The intensity of emissions fluctuated around 0.2 kg per unit of GDP in PPP during 1990–2010. In per capita terms, carbon dioxide emissions increased from 7.3 to 11.7 tonnes, since population growth was slower than the increase in carbon dioxide emissions.

Between 2008 and 2012, Norway exceeded its allocated greenhouse gas emissions quota and can only fulfill its emission reduction obligations through Joint Implementation, Clean Development, and quota trading mechanisms (Statistics Norway, 2013). On the positive side, Norway aims to cap its emissions at 45 to 47 million tonnes of carbon dioxide by 2020 (which would require a reduction of 6 to 8 million tonnes within less than a decade), and also aims to become a low-carbon society by 2050 (Statistics Norway, 2013). Norway aims to meet these goals by facilitating the development of offshore renewable energy production, increasing the tax on carbon emissions from petroleum production, support for low-energy buildings, technological innovations in industry, and introduction of low-carbon transport solutions (Norwegian Ministry of Environment, 2012).

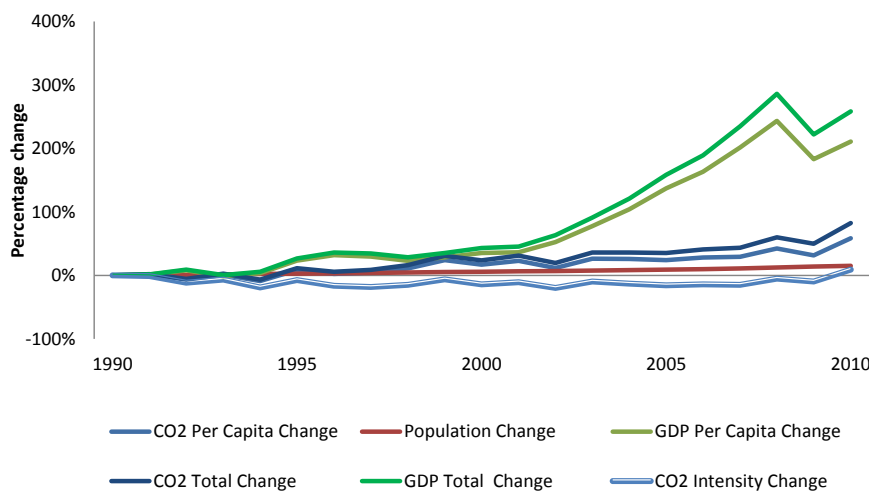


FIGURE 21. PERCENTAGE CHANGE OF TOTAL GDP, GDP PER CAPITA, TOTAL CO₂, CO₂ PER CAPITA, CO₂ EMISSIONS AND POPULATION OF NORWAY BETWEEN 1990–2010

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

In the Republic of Korea, GDP per capita rose from US\$6,150 to US\$22,151 between 1990 and 2010, with a parallel increase of both the population and total carbon dioxide emissions. The economic crisis of 2008 resulted in a decrease in GDP, but carbon dioxide emissions stayed at the same level. However, once the economy started to recover in 2009, carbon dioxide emissions also started to increase sharply. Between 1990 and 2010, the country's population grew at a slower pace than its economy and emissions, and as a result per capita carbon dioxide emissions increased from 5.7 to 11.77 tonnes. The intensity of the carbon dioxide emissions has fluctuated around 0.5 kg/GDP in PPP, but Korea succeeded in slightly reducing it to 0.4 kg/GDP in PPP by 2010.

Recognizing the strong interlinkages between economic development and carbon dioxide emissions, Korea was the first country to introduce a National Green Growth strategy in 2008 for the 2009 -2050 period, and also placed the concept at the heart of its 2009-2013 five-year national development plan (Kamal-Chaoui, 2011). To support the implementation of the strategy, a Presidential Committee on Green Growth was established, consisting of the Prime Minister and 13 Ministers (Young, 2013). Using 23 indicators recommended by the OECD, in 2012 the country evaluated its progress toward green growth. It was concluded that, while the intensity of carbon dioxide emissions, energy use and domestic material consumption has decreased since 2000, progress is not sufficient (Statistics Korea, 2012). On the positive side, the share of governmental research and development (R&D) expenditures in green technologies has been increasing considerably within overall R&D expenditures, from 6.5 per cent in 2002 to 17.5 per cent in 2010 (Statistics Korea, 2012).

After the expiration of the first five-year green growth development plan, the country's Green Growth Strategy is planned to be revised and address the challenges faced during the implementation of the current plan (Young, 2013). These challenges are related to such things as ensuring policy coherence and horizontal cooperation among local and regional governments, the diversification of financing, and capacity building (Kamal-Chaoui, 2011).

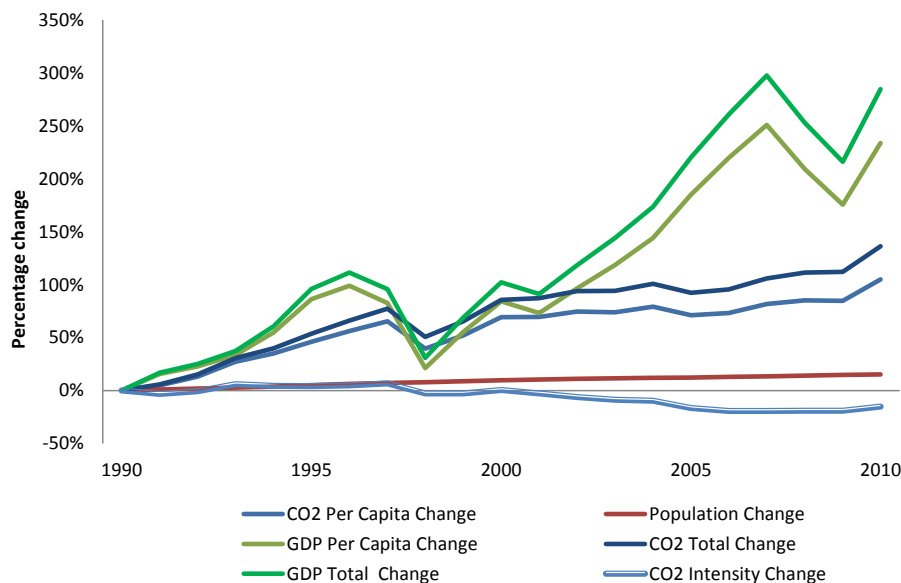


FIGURE 22. PERCENTAGE CHANGE OF TOTAL GDP, GDP PER CAPITA, TOTAL CO₂, CO₂ PER CAPITA, CO₂ EMISSIONS AND POPULATION OF REPUBLIC OF KOREA BETWEEN 1990-2010

Data source: United Nations Statistics Division. (n.d.) Millennium Development Goals Indicators. Data Tables.

To tackle the decoupling challenge, a real transformation of the infrastructural, operational and financial system is required in all economic sectors. Transformation should include, among other things, de-carbonization of the electricity systems, intelligent energy grids, highly energy-efficient, zero- or positive- energy buildings, carbon capture and storage systems (CCS), electrification of transportation systems, and increasing the use of sustainably produced biofuels.

In economies with higher income levels, the issue of overconsumption of resources should be considered, and such countries should aim for decarbonization of the entire economic system, such as is planned in the case of Norway. In countries with lower income levels, the rapid economic development should be decoupled from emissions growth by implementing green technologies and avoiding at all costs becoming locked in the wrong technological choices for the coming decades. Introducing green growth principles as the basis for national development, such as in the case of the Republic of Korea, could be an important milestone for taking a low-carbon pathway. Moreover, underlying regulatory and institutional frameworks, diversified means of financing, and capacity building targeting behavioural change at the individual and at the corporate levels are also crucial to achieve decoupling of growth and carbon dioxide emissions.

3.0 How Development Can Help the Environment: Co-benefits and interlinkages

As this analysis has revealed, and as expected, progress toward MDG-7 targets varied by theme, region and country. The preceding brief review of selected frontrunners illustrated that the underlying causes of progress were diverse, and often involved measures that had broader, not only environmental, objectives or implications. For instance, the adoption of sustainable forest management standards may have contributed not only to meeting forest conservation or biodiversity targets, as in the case of Viet Nam, but also resulted in better access to markets that require certification for the companies involved. More economic certainty usually also supports more secure employment and helps meet social goals.

The indication that success in meeting MDG-7 targets at the national level can be the result of measures that are not primarily, or not only environmental in character, is not surprising. Although categorized by thematic area, the different MDGs are in fact inextricably linked to one another. Success or failure in one sector can affect other sectors—both directly and indirectly—and thus impact upon the overall achievement of the MDGs. It is common knowledge (and inherent in the definition of sustainable development) that environmental change is driven by demographic factors, poverty, production and consumption patterns and other non-environmental dimensions. The economic and social impacts and costs of trending away from environmental goals is also known in cases such as extreme events related to climate change, urban air pollution, or poor water quality and water scarcity, to name just a few.

However, such interlinkages were not reflected in the MDGs, which increased the risk of fragmentation and possibly undermined the effectiveness of the implementation agenda (Fukuda-Parr, 2012). The links were missing not only in the goals themselves, but also from the indicators that were unidimensional measures. This made them simpler to measure and communicate, but could provide the false impression that making progress on narrow technical issues automatically translates into progress in the broader context of ecosystem structure or function.

Besides the obvious need for improved effectiveness in the implementation of global goals, the broader mandate for the SDGs, and lessons from MDG-7 implementation, provide a basis for repositioning the environment with regard to other goals. It is particularly important that this happens early in the process, before the SDG framework, goals, targets and indicators are agreed. Past that point, the policy discourse will shift to financing and implementation, where responsibility will likely be assigned to line agencies in charge of specific sectors and themes. In order to ensure these agencies consider the environment in sectoral SDG implementation, those environmental targets have to be integrated into sector-oriented goals.

The list below provides an overview of some of the key interlinkages between MDG-7 goals and other non-environmental MDGs based on the review of MDG-7 progress in this report. The list of interlinkages is intended to present the key interlinkages between the environmental sustainability targets and the other MDGs. The explanations that follow discuss the alignment of interests between MDG-7 and other relevant MDGs, including an identification of policy levers that advance both MDG-7 and other MDG progress.

- **MDG 7.1: Proportion of land area covered by forests – MDG 1: Eradicate extreme poverty and hunger**

One of the main driving forces of deforestation, particularly in the tropics, is poor people turning to the forests for income generation, and the conversion of forest to farmland. At the root of these drivers are the two aims of MDG-1: poverty, and hunger. Agriculture is the main cause of deforestation at the global level (80 per cent), for both commercial and subsistence purposes—i.e., in many cases to feed people in need (Kissinger Herold, & De Sy, 2012). For example, in sub-Saharan Africa, poverty plays an important part in the loss of forest cover. The main drivers for the collection of fuelwood and wood for charcoal are low income levels and a lack of access to alternative livelihood methods and energy sources. The indicator and target of deforestation is therefore very clearly linked to MDG-1 of eradicating extreme poverty and hunger, and interventions in any one area would most likely benefit from integration with the other. One positive example is REDD+, which goes beyond simply combating desertification, by contributing to local incomes and creating incentives to preserve forests and the ecosystem and social services this provides (UN-REDD, 2009).

- **MDG 7.2: CO₂ emissions – MDG 1: Eradicate extreme poverty & hunger – MDG 8: Global partnership for development**

The second MDG-7 target, to reduce carbon dioxide emissions, is also closely linked to MDG-1. The eradication of poverty and hunger is often seen as an end-goal of economic growth. The “trickle-down” effect promoted by traditional economics claims that through general economic growth, further income-generating opportunities will be created for a population. Such income generation will undoubtedly help to serve the poorest rise from poverty. Yet this economic growth in itself, if following a traditional developmental paradigm, will result in greater emissions of greenhouse gases, through industries fed on fossil fuels. Such developmental pathways—which are by far the norm—have been targeted through new measures to try and “decouple” growth from carbon emissions. Measures such as the Clean Development Mechanism (CDM) therefore try to work against this perverse relationship between economic growth and carbon dioxide emissions, yet have had limited success and require more concerted efforts at the global and national scales. By extension, another close relationship with MDG-7.2 is that with MDG-8: create a global partnership for development. Such global partnerships could help ensure that development pathways adhere to the goal of negating environmental impact, through economic growth that is meant to tackle poverty. Other opportunities also remain for low-carbon technology transfers, which can help to tackle both carbon dioxide emissions and poverty in tandem: examples include improved cooking stoves which reduce the amount of firewood fuel needed (maintaining carbon stocks), and also reduce air pollution (reducing overall emissions), while at the same time improving socioeconomic conditions for users.

- **MDG 7.3: Consumption of ozone-depleting substances – MDG 8: Global partnership for development**

The dramatic global reduction in ODSs is pointed to as the major international environmental success story of the past decades. At its core, the positive outcomes of the Montreal Protocol were due to a highly successful international system that offered a mix of penalties as well as support for countries in phasing out ODSs. One of the major success factors of the Montreal Protocol regime was the ability to learn and adapt as new science and experience with new technology regarding the ozone issue came forth (Parson, 2003): this is a point that should be emphasized when looking at how to build similarly successful international regimes.

The ways in which the international community was able to come together to address ozone depletion is commendable and relates to MDG-8—developing a global partnership for development—as a model that should be learned from in rallying positive forces around the aims of sustainable and environmentally sound development.

- **MDG 7.4: Proportion of fish stocks within safe biological limits - MDG 8: Global partnership for development - MDG 1: Eradicate extreme poverty & hunger**

This target, of ensuring global fish stocks are within safe biological limits, has seen disappointing results. Although country-level monitoring is scattered, it is clear that at the global and regional levels, fish stocks are in general decline (FAO, 2011a), due mostly to overfishing to feed the growing demands for fish and protein. Yet fish populations are not static—they do not exist only within strict national boundaries, so even if one nation may have strict fishing regulations, this does not ensure that fish stocks will be kept at safe levels if other nations do not maintain such standards. Therefore, the maintenance of fish stocks at safe biological limits requires the concerted efforts of international partners, related again to MDG-8 of a global partnership for development. In addition, the linkage of MDG 7.4 to MDG-1 must not be overlooked. Well-managed fisheries can contribute to poverty reduction, by providing a reliable source of protein as well as income-generating opportunities for poor fishers (Howard, C. and Arthur, R.I., 2005). On the flip side, the collapse of fisheries will hit the poorest the hardest—eliminating an important nutrition and income source. Ensuring fish stocks remain at safe biological limits will contribute to the eradication of poverty and hunger, but only if the global community takes coordinated efforts to do so. Some actors have started to see these positive interlinkages, and recently targeted investments in strengthening small-scale fisheries as well as the development of aquaculture have been developed as strategies for poverty and hunger reduction (World Fish Center, 2008).

- **MDG 7.5: Proportion of total water resources used - MDG 1: Eradicate extreme poverty & hunger**

At the global level, agriculture is responsible for 70 per cent of water abstractions, mainly for irrigation use (UN Water, 2012b). Many efforts to improve agriculture (and therefore contribute to hunger and poverty reduction in the developing world) advocate practices that involve irrigation as a major component. This, along with increased population levels and thus higher demand for water for daily purposes in addition to agriculture, will lead to even greater abstractions of water at the global level, and contribute to ever-increasing water scarcity in many regions of the world. All of this contributes to a vicious cycle, where greater abstractions of water resources to “feed the world” can have the opposite impact of reducing ecosystem health in the long term and therefore contribute to even greater hunger and poverty. Another important note is related to food waste: globally, one third of food produced ends up as waste (FAO, 2011b), yet still many in the world go hungry. Reducing food loss and food waste in production and consumption chains can help reduce the impact of water abstraction, and at the same time contribute to hunger reduction. In addition, food that has a high virtual water content and is locally produced automatically serves not only poverty reduction, but also water-saving purposes. Therefore, considering the entire food chain can help to develop targeted interventions that can serve the dual purposes of water reduction as well as contribute to poverty and hunger reduction.

In addition, this target also has close linkages to a variety of other issues such as energy and food production, industry, and ecosystem services as well as peace or security (UN Water, 2013), which can also be linked indirectly to poverty and hunger eradication. For instance, in Pakistan 17 water catchment areas were improved through management and restoration of deforested areas. This activity is also in line with the country's stated intention to balance the environment with economic development and thus poverty alleviation (Government of Pakistan, 2013).

- **MDG 7.6 and 7.7: Reducing biodiversity – MDG 1: Eradicate extreme poverty & hunger and MDG-6 Combat HIV/AIDS, malaria and other diseases**

The Convention on Biodiversity calls for a broader understanding of biodiversity conservation, one that includes ecosystem services and natural resources. In this regard, the two indicators of MDG 7B can also play an important role in eradication of poverty and hunger by contributing to food security, more sustainable and resilient agriculture and fisheries, as well as by reducing land degradation (CBD, 2013). Research has also shown (Campbell et al., 2012) that the deterioration of ecosystem resilience has a direct impact on epidemic, infectious and water-related diseases while the genetic diversity has a direct impact on access to traditional nutritional sources and medicines (CBD, 2013).

- **MDG 7.8: Proportion of population using an improved drinking water source – MDG-3 Promote gender equality & empower women – MDG-2 Universal education**

In the developing world, women and girls disproportionately hold the burden for fetching water for their households (UNICEF, 2013). This means long hours, long distances, and often significant health effects from the heavy loads they must carry. The time and effort needed for collecting water therefore compromises time available for other activities, such as school attendance or income generation. Providing improved water sources closer to any given household has been shown to significantly improve school attendance of girls (UNICEF, 2013); improved drinking water access can thus be a deliberate, although not obvious, strategy to achieve MDG-2 of achieving universal primary education. Additionally, by reducing the burden on women's time and health from collection of water, the empowerment of women (MDG-3) can be strengthened through newly available time and energy to engage in other activities such as income-generating businesses.

- **MDG 7.9: Proportion of population using an improved sanitation facility – MDG-4 Reduce child mortality – MDG-5 Improve Maternal Health**

One of the strongest interconnections exists between the “environmental sustainability” and “health” MDGs, although this has not been well reflected in implementation. The mutually reinforcing relationship between water and sanitation, maternal—and by extension, child—health have long been understood as a given, yet this area is relatively under-appreciated. A recent study by Cheng, Schuster-Wallace, Watt, Newbold & Mente (2012) quantified this relationship using global data, and found that access to improved water and sanitation facilities independently and significantly contributes to decreases in infant and maternal mortality rates. In fact, infections are a leading cause of all maternal deaths (15 per cent) in the immediate weeks after childbirth, and can be attributed largely to poor hygienic practices during delivery (Cheng et al., 2012). Basic hygiene measures during pregnancy and childbirth, and improved access to water (with closer distances and better quality) are key measures to improve maternal and infant health (Shordt, Smet, & Herschderfer, 2012). There is a need for more purposeful interventions that consider these synergies. While the goal of

improving maternal health (MDG 5) has seen progress, the world is lagging far behind the target of a 75 per cent reduction in maternal mortality (UN, 2012a). This low success rate also reflects the poor performance in improving sanitation facilities, which also will not meet the target by 2015.

- **MDG 7.10: Proportion of urban population living in slums - MDG-6 Combat HIV/AIDS, malaria and other diseases - MDG-4 Reduce child mortality**

Slums, by definition, are urban areas without access to basic services such as sanitation and potable water, substandard housing, overcrowding and insecure tenure. Such conditions contribute to a large proportion of waterborne disease in slums, such as malaria, cholera and typhoid (Ramin, 2009). The spread of such outbreaks is further accelerated due to the close living conditions of slum dwellers. In addition, children are most at risk of such disease in slum areas, bearing up to 40 per cent of the disease burden (Ramin, 2009). Therefore, the MDGs aimed at combating disease and reducing child mortality, have a strong link to reducing the proportion of urban populations living in slums—and there is high potential for synergies between these goals. Targeting these goals in tandem requires getting to the root causes and breaking the cycle of disease and poverty. People less likely to suffer the consequences of communicable disease are more likely to be able to successfully enter and stay in the workforce and ensure more secure livelihoods, improving their living conditions (i.e., moving out of slums), and thereby reduce risks of contracting these diseases.

The brief review of selected interlinkages showed that MDG-7 goals and targets can be a function of forces outside the environment sector. Recognizing these linkages would be a first step in the goal-setting process, but actually building them would require a much more thorough understanding of the nature, depth and dynamics of the relationship. The box below illustrates another relationship between an MDG-7 issue (MDG 7.9: water and sanitation) and a human well-being-related goal (MDG 5: maternal health) in the regional context of selected sub-Saharan African countries, underlining the importance of interpreting these relationships in their own context, but also illustrating the potential for major improvement if synergies between goals are recognized, resources are pooled, and stakeholders coordinate efforts.

CASE STUDY: MATERNAL HEALTH/WATER AND SANITATION

Sub-Saharan Africa currently faces the highest rates of maternal mortality, as well as lack of access to sanitation facilities and improved drinking water, worldwide. Despite this general trend, there are stories of success that may highlight this relationship between maternal health, water and sanitation.

Eritrea once had the highest maternal mortality rate (1,400 deaths per 100,000 live births), but now is one of only four African countries on track to reach the 2015 target (a rate of 350 deaths per 100,000). How did Eritrea manage such success? Integrated efforts have provided not only wider and localized health access, but also maternal and neonatal health education, in which sanitation plays an essential role (UNDP, 2013b). Access to drinking water has also accelerated, which studies have shown contributes to greater pre and post-natal maternal health (Shordt et al., 2012; Cheng et al. 2012). Other countries should follow suit. The graph above shows that sub-Saharan African countries with the most significant improvements in maternal health, which correlate with similar improvements in sanitation. Maintaining such a trend, and improving the synergies between them, will undoubtedly lead to more successes.

Based on recent studies and calls for change (Cheng et al. 2012; Shordt et al., 2012), it is clear that achieving both the sanitation and maternal health targets will require higher levels of synergy and purposeful interventions that tackle both issues in tandem. Particularly in the post-2015 landscape, it will be necessary to take such systems-thinking approaches in order to achieve overall sustainability goals.

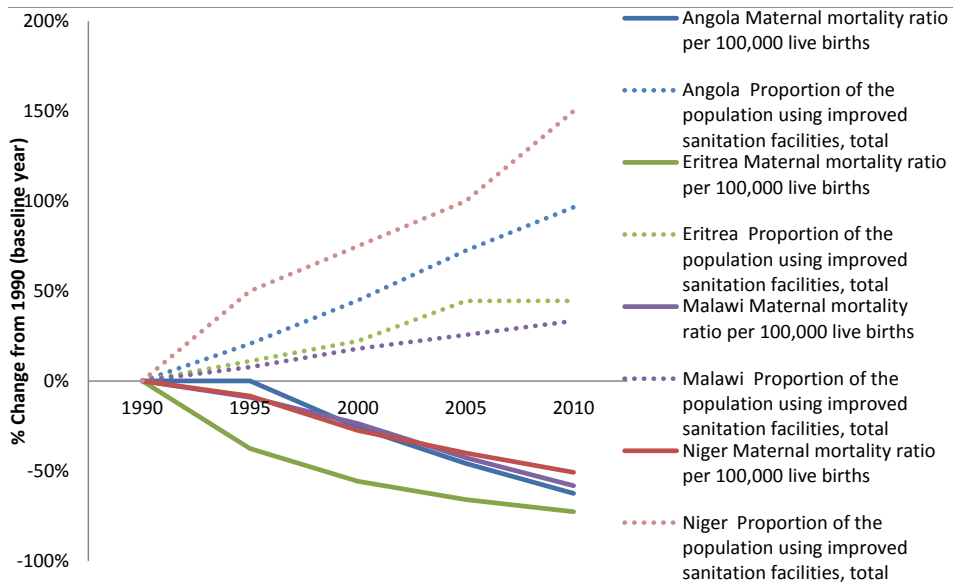


FIGURE 23. HIGHEST REDUCTIONS IN PERCENTAGE MATERNAL MORTALITY RATE VS. PERCENTAGE IMPROVED SANITATION FACILITIES (SUB-SAHARAN AFRICAN COUNTRIES WITH A POPULATION HIGHER THAN 1 MILLION)

Data source: United Nations Statistical Division

The synergies between environment and development that were identified in the context of MDG-7 are significant and potential game changers. However, as they were not built into the MDGs and MDG implementation, one cannot assume that they will be considered in the case of the SDGs, unless they are purposefully taken into account during SDG design and implementation.

While the SDGs will be identified at the global level, their implementation will happen at the scale of countries, regions and communities. Global SDGs will need to be translated into national policies and programs that will happen in many different contexts around the world. The integrated treatment of the environment in global SDG development therefore does not mean the work is done; through capacity building, bilateral and multilateral collaboration, integrated global goals need to be reflected in integrated national programs. While countries are not starting from zero, especially those that have made a serious attempt at environment/development policy integration through sustainable development strategies or similar instruments, significant investment in improving governance and institutions to make sure they are able to meet the challenge of delivering integrated goals will be needed.

4.0 Conclusions

The environment was covered in the MDGs through MDG-7 and represented a symbolic, rather than systematic treatment of the environment in the goals. Nevertheless, the issues covered by MDG-7 are all critical for both human well-being and the healthy functioning of ecosystems, and they expressed a recognition that progress and sustainability in one domain closely depends on the other. While regular stocktaking of MDG-7 progress has reviewed progress at the global level, the relationship between human well-being and environmental sustainability often plays out at the national level. As the implementation period of the MDGs is drawing to a close in 2015, it is important to understand progress in more detail, and to use the information in a more systematic and integrated treatment of environmental sustainability and human well-being during the finalization of the new goals in the post-2015 development agenda, and the preparation for their implementation.

The evidence-based review of MDG7 progress in this report, with a systematic consideration of national-level performance for the first time, shows a mixed picture. As expected and as already known from more detailed integrated environmental assessments carried out, for example under the respective international conventions or comprehensive integrated environmental assessments such as UNEP's Global Environment Outlook, progress is recorded in a few important areas, while progress toward several of the targets is insufficient or there is continuing degradation. Performance in most cases is uneven also in the geographic sense, with evidence showing clear frontrunners, but also cases where environmental degradation continued, often related to the same indicator.

Progress on individual goals and targets can be summarized as follows:

- According to the data reviewed, Target 7A (*Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources*) will not be reached at the global level—trends are negative except the ODS indicator. Data on fish stocks and fresh water indicators is fragmented which makes systematic trend analysis and comparisons over time and space problematic.
- With regard to Target 7B (*Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss*), the indicator for protected areas was progressing well; however, despite the increase in protected areas, the percentage of species threatened by extinction is not declining: indeed, as other analyses have shown, it is already well beyond the background rate of extinction that could be considered sustainable. This indicates either that protected areas were not efficiently designated and managed, but also that species conservation strategies cannot be limited to the designation of protected areas. Measuring the number and trends in endangered species at the country is problematic due to lack of data and adequate monitoring.
- The best performance on MDG-7 is on Target 7C (*Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation*), where targets for one or both indicators will be reached: proportion of the population using an improved drinking water source and using improved sanitation facilities. One possible explanation for this success is that the issue under Target 7C is directly linked to other MDG7 issues, including poverty eradication, health and women's empowerment, and benefitted from both progress in and attention to these areas.

- The indicator for Target 7D (By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers) is not measured properly in many countries, so a uniform evaluation of progress is not possible and comparisons are difficult. However, available data shows that the percentage of slum dwellings is showing a decreasing tendency, although the global target will not be met in several regions.

The analysis of progress based on MDG-7 indicators confirmed and provided further illustrations for interlinkages between poverty and the broader notion of human well-being and specific environmental trends.

Almost all of MDG7 can be linked to MDG1. In the short term, eradication of poverty and hunger often results in the deterioration of the environment as countries industrialize or exploit primary natural resources such as forests or mineral reserves. While increasing wealth often also comes with increasing environmental awareness and conditions, if environmental deterioration persists, it could trap countries or segments of their populations most directly relying on the products and services of natural ecosystems in enduring poverty, as highlighted in earlier global assessments (MA, 2005; see Section 2.5). Sound economic development and environmental management are interdependent—taking this interdependence into account is essential for achieving poverty reduction and general human well-being.

This interdependence and the potential for effectively taking it into account in development planning and implementation is illustrated by national examples. For example, Vietnam achieved remarkable success in poverty reduction, while forest cover also increased, as shown by the indicator for Target 7A. As the economy developed, farming systems and property rights improved, intensive farming could move from marginal to more fertile land. Well on its way to become a middle-income country, Vietnam's future challenges now include dealing with the effects of rapid urbanization, and high vulnerability to climate change, illustrating that a higher development status would only transform—but not in any way weaken—connections between environmental conditions and human well-being.

In the MDG-7 set performance in the area of water also showed a strong relationship with human well-being. This was clearest in the case of maternal health, where, for example, in Angola and Eritrea rapid improvement in the sanitation and drinking water indicator was paralleled and shown to causally linked with falling maternal mortality rates. The multiple interlinkages between water, human well-being and economic sectors such as agriculture make it a particularly good candidate for systems-oriented, watershed or ecosystem-based implementation mechanisms. The same is true for biodiversity, which directly underpins human well-being particularly often among the poorer segments of rural populations.

Beyond interconnections between MDG-7 issues and other, poverty-focused dimensions of the MDGs, there are several other key sectors where linkages to MDG-7 are essential. This includes areas such as sustainable production and consumption, energy, peace and security and others that have already emerged as key priorities in the SDG process. Keeping interlinkages in mind in goal and target setting, indicator development and particularly implementation planning is important.

This ex-post review of MDG-7 performance highlighted gaps and weaknesses in data and monitoring. For several targets and indicators consistent reporting and comparisons of progress across all affected countries was not possible due to data limitations. Considering the importance of monitoring, review and reporting and given that these are activities that require significant institutional capacities that take time and effort to build up, it is important that discussions about means of implementation address them as a priority.

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Annex 1: Table of interlinkages

MDG 7: ENVIRONMENTAL SUSTAINABILITY							
	MDG 1	MDG 2	MDG 3	MDG 4	MDG 5	MDG 6	MDG 8
Indicators	Eradicate extreme poverty & hunger	Achieve universal education	Promote gender equality & empower women	Reduce child mortality	Improve maternal health	Combat HIV/AIDS, malaria & other diseases	Global partnership of development
7.1 Proportion of land area covered by forest	X						X
7.2 CO ₂ emissions	X						X
7.3 Consumption of ozone-depleting substances							X
7.4 Proportion of fish stocks within safe biological limits	X						X
7.5 Proportion of total water resources used	X						
7.6 Proportion of terrestrial and marine areas protected							X
7.7 Proportion of species threatened with extinction							
7.8 Proportion of population using an improved drinking water source		X	X	X	X		
7.9 Proportion of population using an improved sanitation facility				X	X	X	
7.10 Proportion of urban population living in slums	X			X	X	X	

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